

# THE IRON AGE

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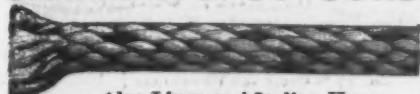
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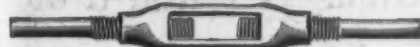
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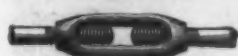
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# THE IRON AGE

New York, Thursday, September 28, 1905.

## The New Plant of the B. F. Sturtevant Company, Hyde Park, Mass.

A visitor to the new works of the B. F. Sturtevant Company, at Hyde Park, Mass., is particularly impressed by the amount of equipment that is of the company's own manufacture. Beginning with the power plant, the mechanical draft fans, economizer, feed pumps, engines, generators and exhaust heads are all of Sturtevant make. Throughout the shop the tools are driven by Sturtevant motors, as well as the cranes, hoists and elevators. The heating systems entire, the blowers for the cupolas and forges in the foundry and blacksmith shops and the forges themselves are all standard Sturtevant goods. Many other parts of the equipment were made by the

ened to severely cripple the business. This disaster was recovered from with remarkable rapidity, and 30 days later the plant was practically in full operation again, although in that time it had been necessary to purchase and install a nearly complete equipment of new machine tools. The fire had the effect of hastening the preparation of the plans for the new plant.

### The Choice of the New Site

was determined largely by such considerations as proximity to raw materials, availability of skilled labor, adequate shipping facilities, ample water supply and space



Fig. 1.—Interior of One End of the Machine Shop, Looking Toward the Testing Building.

company, but mainly as special designs not listed in its regular products, such as bench leg castings, special cranes and trolleys and a complete works railway system with several special cars in the foundry.

The old plant of the company at Jamaica Plain, Mass., 6 miles from the new location, was only two-fifths of the size of the present plant. As the company's business grew it was found that the increasing requirements could never be met at the old location. The size was insufficient, the buildings were not conveniently arranged to allow for expansion and the railroad facilities were inadequate. While negotiations were under way for the purchasing of a new site a fire occurred at the Jamaica Plain works, April 14, 1901, which destroyed a large amount of valuable machinery and threat-

ened to severely cripple the business. The West offered advantages in the way of reduced rates for raw material, but all things considered it was the conclusion that the quality of the skilled labor in New England more than offset that advantage.

The site finally selected was a lot of nearly 20 acres in Hyde Park, which is already well known as the home of the Becker-Brainard Milling Machine Company, the American Tool & Machine Company and of the new shops of the New York, New Haven & Hartford Railroad Company. The town has a large population of skilled workmen, which was drawn upon to supplement the employees brought from the old works. The grounds have a frontage of 1300 feet on the freight yard of the New York, New Haven & Hartford Railroad at the Readville station,

which is the distributing point for all freight passing over the Midland and Providence divisions of that road. At one side of the lot there is a plentiful stream and the adjoining shore is 10 feet below the level of the yard, leaving sufficient space for dumping waste material for years to come.

Before the size and character of the buildings were decided the head of each department was asked to sub-

the needs grow. They are arranged in a group parallel to the railroad tracks, with spaces between them for spur tracks, and in certain buildings tracks enter at the ends. All the buildings can be added to at their rear ends. The type of construction is somewhat composite, consisting of steel interior columns and main steel girders, with heavy brick walls, wood timbered floors and plank roofs. The roof of the one-story foundry building is

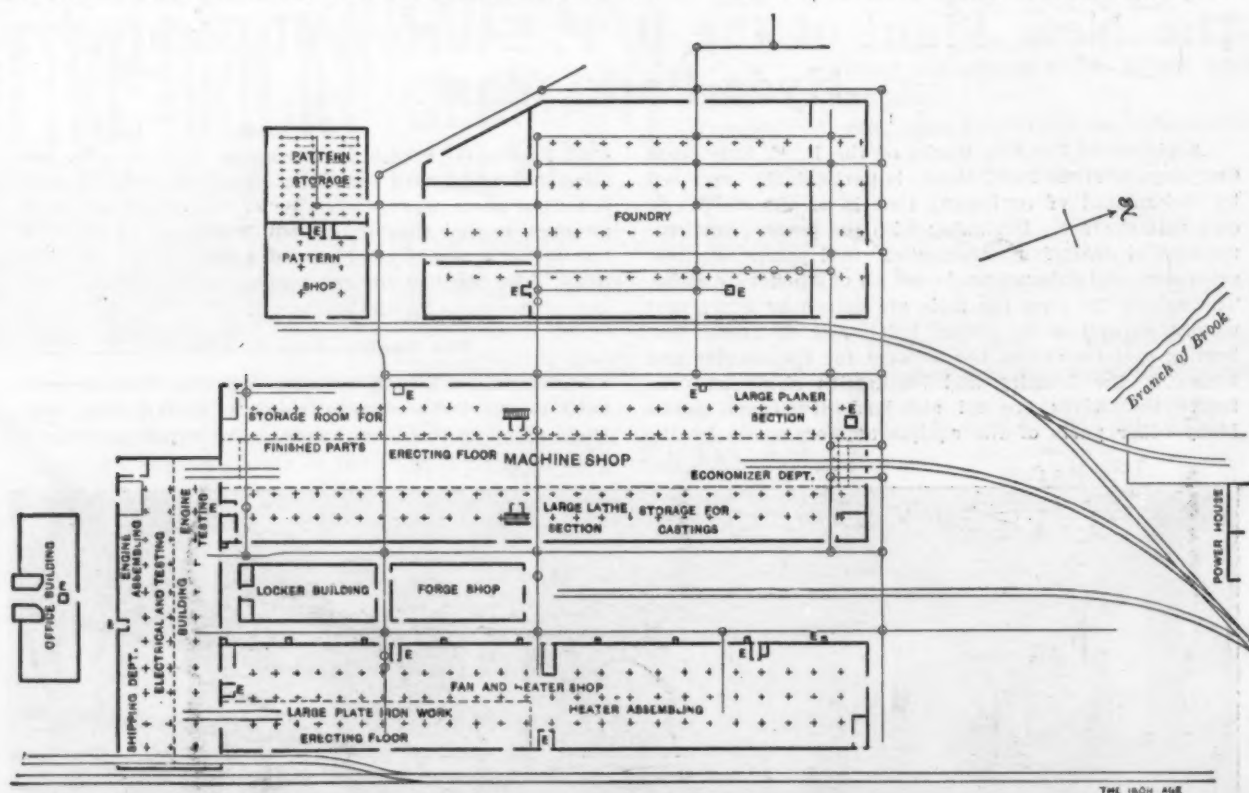


Fig. 2.—Plan of the Works, Showing the Spurs from the Railroad and the Industrial Railway System.



Fig. 3.—View Down the Central Bay of the Machine Shop, Taken in the Same Direction as Fig. 1.

mit recommendations in writing, and frequent conferences were held as to the requirements of the individual departments. It was concluded that a total floor space would be required slightly more than double that of the old plant, but eventually an aggregate floor area of over 9 acres was allowed, or nearly two and one-half times that of the Jamaica Plain plant. The plant will accommodate nearly 2000 hands and there are now about 1300 employed. A special train runs directly into the yard and is a great help in taking the men to and from work.

The buildings are disposed to allow for extensions as

supported by steel trusses and in the other buildings open timbering is employed, with wooden columns in the upper story. The main floors in the machine, fan and erecting shops are of tar concrete, upon which 3-inch hemlock is bedded in liquid pitch and toe-nailed together. The upper floors are supported upon hard pine beams 4 feet between centers, spanning the space between the steel girders, which follow a unit system of 20 feet on centers throughout the buildings. The machine shop gallery floors are designed for a load of 250 pounds per square foot and are of 2½-inch plank; other upper floors are of 2-inch plank for 200 pounds load per square foot. Maple top

flooring is used in all cases and all roofs are of 3-inch plank, with tar and gravel top.

#### The Power Plant.

Current for light and power is supplied at 220 volts from a central power station containing at present one 100-kw. and one 250-kw. Sturtevant generating set.

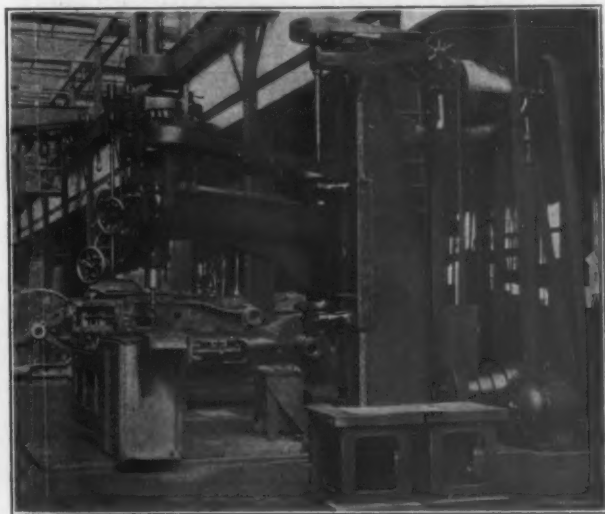


Fig. 4.—The 7-Foot Baush Radial Drill in the Machine Shop.

The engines run condensing. The exhaust steam from engines under test in the testing building is utilized for heating, being supplemented with live steam at reduced pressure as may be required. Waste exhaust is discharged through a Sturtevant exhaust head. The boilers are equipped with a Sturtevant fuel economizer for heating the feed water.

The power house is placed far enough from the ends of the buildings to allow the latter to be extended and near enough to the water supply to minimize the handling of water for condensing and other purposes. A concrete tunnel connects a system of covered branch trenches with all the buildings and contains the pipes for steam and compressed air and the electric wires.

#### The Pattern Building and Foundry.

Foundations for many of the buildings were put in during the late fall of 1901. Actual work of construction



Fig. 5.—Storage of Crank Shafts in Machine Shop.

on the foundry and pattern buildings began in July, 1902, and the first heat was poured December 29 of that year. A description of the foundry was printed in *The Iron Age* October 29, 1903, and one of the pattern shop November 3, 1904. For that reason they are only briefly referred to here.

About one-half of the pattern building, a section

80 feet square, is two stories high. The first floor is occupied by carpenters, flask makers and metal pattern makers, and the second floor by the regular pattern makers. The other half of the building is used as a pattern storage and has intermediate floors, making four in all. The two sections of the building are separated by double fire walls and automatic closing fire doors. The building is in close proximity to the foundry, which facilitates intercourse between the two.

The foundry is 350 feet long and 170 feet wide and has a floor track system for distributing molten iron consisting of a 24-inch gauge railway bedded in concrete. Two craneways run longitudinally of the building through the greater part of its length, and the tracks extend beneath a lateral traveling crane in the cleaning room at the end of the building. The brass foundry is located in one corner, a wash and locker room in the adjacent corner and a corerom between the two. Storage for supplies is provided on one side adjoining the railroad switch. From the bins here located the iron and fuel charges, previously weighed, are carried directly to the charging floor.

#### The Machine Shop.

From the foundry the castings are conveyed to the rear of either the machine shop or the fan shop. The former is a building 500 feet long, with wings 40 feet wide, containing galleries and a central craneway of the

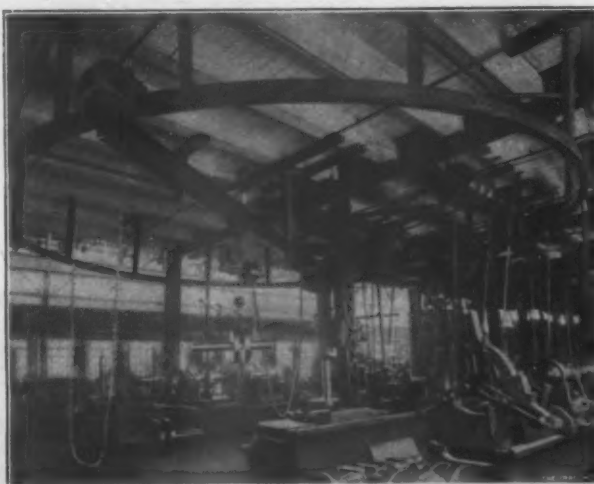


Fig. 6.—A Trolley Jib Crane of Original Design, Used in the Handling of Engine Parts to the Tools.

same width designed for a 20-ton crane. Very effective lighting is secured through a series of sawtooth skylights running crosswise of the roof, with glass sides facing north. The present crane, which may be seen in Fig. 1, is of only 10-ton capacity and serves the entire floor. In regular course it finally deposits the substantially complete engine or generator upon a transfer car, which passes through to the testing building, where a 15-ton crane picks up the machine, lowers it upon the testing plate and subsequently carries it forward to the railroad track which passes into the end of the building containing the shipping department, where there is sufficient space to allow loading two cars at a time. This course of the work may be followed by referring to the plan, Fig. 2. At the opposite end of the machine shop from the testing building steam and industrial railway tracks enter. As a rule large castings and forgings are received at this end and transported by the crane, while smaller parts are brought in through numerous side entrances and are handled by hoists and trolleys or by hand. Industrial tracks cross the buildings at the center and at both ends. The center cross track is in direct line with the track from the foundry and the one to the fan shop.

Upon the ground floor in the corner near the erecting shop is located the general storage room and the office of the storekeeper. This room is 40 x 100 feet and

contains all general stock, such as brass and malleable castings and complete parts of engines ready for assembling. The tools are arranged for the progress of the work from the open end of the shop toward the finished stores and erecting shop. Ultimately there will be an independent department for the manufacture of the economizers, but at present this work is done near the entrance of the machine shop in the section in the foreground of Fig. 3. With this exception the grouping of the

boring mill, and a 60-inch and a 48-inch Johnson lathe. The last has a 24-foot bed and is driven by an individual 10 horse-power motor. At the end of the central bay near the storeroom is a rack for the stock of completed crank shafts, Fig. 5. Under the west gallery, near the north end, is a line of planers of Gray, Cleveland, Flatner and other makes, the largest being a 48 x 60 inch Cincinnati planer, driven by a 10 horse-power contained motor. A group of radial drills and several horizontal

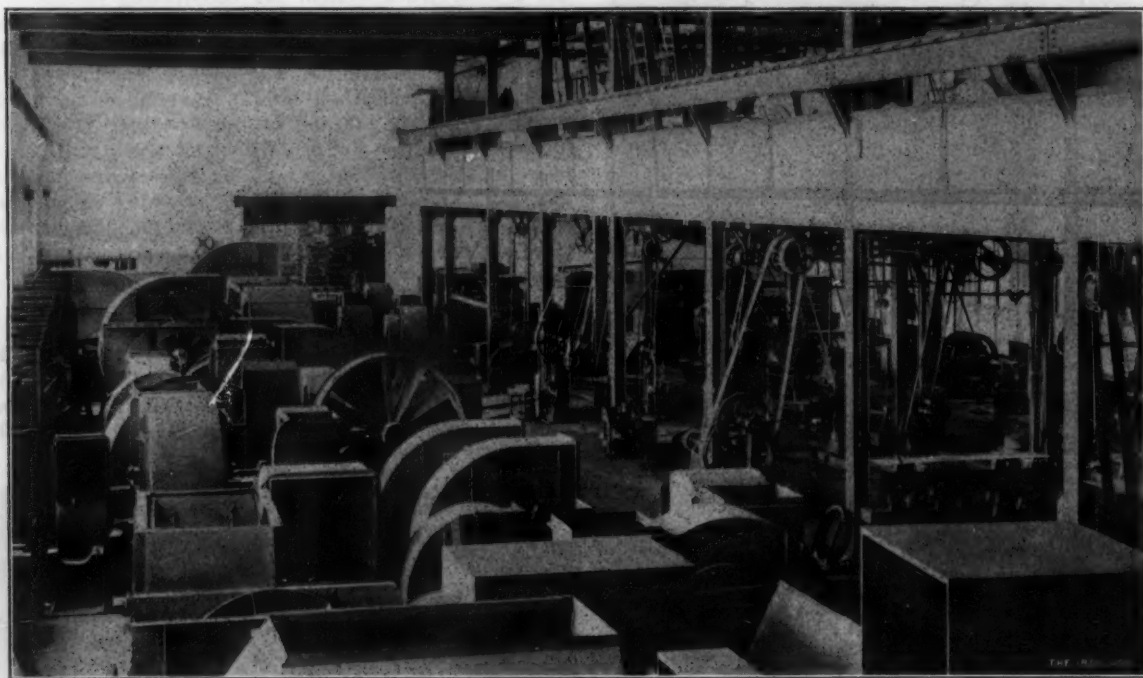


Fig. 7.—The Erecting Floor in the Fan Building.



Fig. 8.—The Heater Department in the Fan Building.

machines follows the general scheme. Tools used for the economizer work comprise a Bickford nine-spindle drill, which simultaneously bores the holes in the economizer headers, boring through both sides at one setting; a Becker-Brainard vertical miller, which faces the flanges of the heater sections, and a multiple spindle Baush drill for boring all the holes in the flanges at one operation.

In the open craneway are located two Detrick & Harvey open side planers, one a 60-inch, the other a 72-inch, driven by individual motors; a 6-foot and a 7-foot Baush radial drill, Fig. 4; a Beaman & Smith horizontal

boring machines, all served by traveling cranes on a continuous runway, are in the adjoining section. Beyond these are the large vertical and planer type milling machines. Under the opposite gallery are arranged the large vertical boring mills, including a 76-inch Bullard and a 60-inch Niles mill; the large upright drills, a complement of chucking crank shaft and shafting lathes, several Gisholt and Conradson turret lathes, Fosdick and Prentice radial drills and a large Landis shaft grinding machine with 10 horse-power motor. Near the south end of this wing there is a unique jib crane, illustrated in

Fig. 6. The pivot of the jib is suspended from the ceiling and the outer end is carried by a truck running on a circular track. This may be racked by hand to any angle. An electric hoist travels on the lower flange of the I-beam that forms the jib. By this construction free head room is maintained within the field of the crane.

Communication with the second floor is afforded by four elevators and an equal number of stairways, one at each end and two at the center. The galleries are connected at the end by bridges; the one at the end adjoining the erecting shop is partly occupied by a grinding and polishing room, which is equipped with a Sturtevant exhaust fan, hoods and piping. The brass finishing department and the office of the superintendent of the machine shop are on this floor, close to the grinding room. In the opposite gallery, where they will be most accessible, are the tool making and tool storage rooms. An inclosed bridge connects this floor with the second floor of the fan shop.

The machine tools in the galleries are grouped by types and as far as possible are arranged for progressive operations. Space is left for additions in supplementary

adjoining space on the first floor are installed large shears and brakes for cutting and folding plates up to 120 inches in length and rolls for  $\frac{1}{2}$ -inch plates 120 inches wide. In the steel plate work pneumatic tools are extensively used, including punches, riveters and chippers. The plate iron is stored on edge in diagonal alcoves in a storage shed alongside the fan shop, which has a capacity for nearly 1000 tons.

Immediately above, in the gallery, is a supplementary equipment of smaller plate working tools, punches, &c. Upon this floor are built all of the steel plate fan casings for planing mill exhausters and small steam, electric and pulley fans.

The packing and shipping department is located about midlength of the first floor, near a large 5-ton elevator, which serves all floors. The other end of this floor contains the heater department, Fig. 8, and is devoted to the manufacture of heater sections for the Sturtevant steam hot blast apparatus. These sections are made of 1-inch pipe, which is cut to lengths and threaded in pipe machinery and made up into sections by screwing into cast iron



Fig. 9.—View on the First Floor of the Electrical and Testing Building.

parallel rows. Throughout the shop the large machines are driven by individual Sturtevant motors and the smaller tools are group driven from line shafting by 20 horse-power motors suspended from the ceiling.

#### **The Fan and Heater Department.**

The building devoted to the manufacture of fans, heaters and the equipment associated with them is three stories high, of the same length as the machine shop and 80 feet wide. It is of mill type construction and is provided with all conveniences for handling material, the arrangement being such that goods can be received at and shipments made from numerous points along one side while other supplies are brought in from the court between this building and the machine shop.

At one corner of the building the second floor is cut through, leaving the first floor open to the roof for an area approximately equal to one-quarter of the floor area. This section, a view of which is given in Fig. 7, is served by a 5-ton traveling crane and has a 32-foot clear height to allow for the construction of large steel plate ventilating and mechanical draft fans and heater jackets. In the

bases. The sections thus made are tested by hydraulic pressure to 180 pounds per square inch.

Above this department, on the second floor, cast iron fans, forges and countershafts are assembled, all machine work necessary to these parts being performed here. The fans are given a rigid inspection test before shipping. Nearly one-half of the third floor is given up to galvanized iron work, the making of air distributing ducts and shapes, the manufacture of exhaust heads, &c. On the same floor fan wheels, ranging from 6 inches to 20 feet in diameter, are set up. The rest of this floor is occupied by the punching and commutator division of the electrical department, which is located upon the adjoining third floor of

#### **The Testing and Electrical Building.**

This building measures 80 x 240 feet and is three stories high. Each of the two upper floors are provided with small individual traveling cranes. In one end of the space occupied by the electrical department is the baking room for armatures, &c. This room is 40 feet square, entirely fire proof and contains two steam heated ovens. The special storeroom for electrical supplies is

at the other end of this floor. The balance of this floor and the intermediate floor below are devoted to winding, assembling, testing, &c. The fans to be motor driven are here equipped with motors and are run under test conditions. Generators for direct connection to engines are taken down to the first floor of the same building, attached to their respective engines and given a continuous run upon the test plate, which may be seen at the right in Fig. 9.

The remainder of the first floor is given to the assembling of engines, at the left in Fig. 9, and to the packing, storage and shipment of machines. The testing plate, measuring about 30 x 60 feet, is equipped with steam and electrical connections. The engines are here given efficiency tests and may be run condensing or noncondensing. The equipment for testing is very complete and has proved very useful in conducting the rigid tests demanded by the United States Navy Department upon the engines, generating sets, engine and motor driven fans which this company has furnished to the Government in large numbers.

#### **The Blacksmith Shop.**

The smith shop is located between the machine shop and the fan buildings, where it serves each with equal facility. The building is 40 x 100 feet and is equipped with a large number of Sturtevant forges, a blower for the blast and an exhaust fan for removing the smoke. The tools in this department include a Dupont power hammer, an 1100-pound Bement-Miles steam hammer and heavy shears for cutting angles and tees, of which thousands of tons are used annually in the construction of fans and heaters. In a room in the court near the smith shop and between the fan and machine shops is stored under lock and key all of the high grade bar iron and steel, and upon a piling floor and in open racks are kept all of the structural shapes required.

#### **The Locker and Wash Rooms.**

The wash house and locker room, which also measures 40 x 100 feet, is two stories in height, and is located between the smith shop and the testing building at a convenient center, so as to be within the least distance of the majority of the workmen. A separate building with concrete basement is provided for the storage of oil, paint, naphtha and other inflammable stock.

As was previously mentioned, the entire industrial equipment was designed and constructed by the company. It comprises an industrial railway system, including platform, coal, charging and dumping cars, ladle trucks, truck ladles and turntables. The general factory equipment, consisting of cast iron bench legs, electric hoists, wash sinks, shelf brackets for patterns, manhole, catch basin covers and frames, trench cover plates and hangers, is also of the company's own manufacture.

All the buildings are heated and ventilated by the Sturtevant system. In the machine shop the hot air pipes are placed beneath the second floor wall benches and deliver most of the air downward to the first floor. The fan and erecting shops are supplied by an underground duct, which delivers the hot air to external vertical flues upon one side of the building. In the fan shop these are located 40 feet apart and discharge the air across the building above head level.

The office building is a model structure of its kind, four stories in height, and serves as the headquarters for the entire business. It contains the correspondence, accounting, designing and drafting offices, the production department, the advertising bureau, with a printing office and lunch room in the basement.

A cablegram from Stockholm says that the representatives of the International Harvester Company are seeking options on sites in southern Sweden with a view to building works from which the trade of Northern Europe can be supplied. Clarence S. Funk of Chicago, general manager of the International Harvester Company, confirms the above report and says that the step has been taken in view of the high tariffs which will soon go in force in Germany and Austria-Hungary and the possibil-

ity that retaliatory tariffs against American machinery will be employed in other European countries. It is stated that other manufacturing interests in the United States are investigating the possibilities of establishing European works to hold and extend their trade abroad.

### **Recent Customs Decisions.**

#### **Wire Draw Plates.**

The Board of United States General Appraisers in a decision written by I. F. Fischer, promulgated September 22, makes a ruling of interest to importers and handlers of wire draw plates and wortles. The specific case decided by the customs tribunal stands in the name of the C. Newman Wire Company, New York. The articles are used for wire drawing. The draw plates are flat square steel plates, having small holes of various sizes through which wire is drawn to the desired gauge. The wortles are bars of steel of various lengths, all about 1 1/4 inches wide and 1 1/2 inches deep, having holes for wire drawing similar to those in the draw plates. The local appraiser at the Custom House returned the merchandise as "draw plates, manufactures of metal," with duty at the rate of 45 per cent. ad valorem. One of the claims made by the importer is that the merchandise is properly dutiable under the provisions of Paragraph 135 for "plates and steel in all forms and shapes not specially provided for." General Appraiser Fischer, in sustaining the contention of the importing firm, says that while the articles are undoubtedly manufactures of steel they are dutiable, according to certain rulings of the United States Circuit Court, under the classification claimed by the protestants. Paragraph 135 provides various specific duties according to the value of the merchandise. The Attorney-General will decide whether the United States is to carry the case into the Federal courts.

#### **Machinery or Castings.**

The General Board has decided adversely a claim for lower duty on machinery imported by Sidney Blumenthal & Co. and A. Pouchet of New York. Collector Stranahan assessed duty under the provision in the tariff law for "manufactures of metal," with the duty at the rate of 45 per cent. ad valorem. Among the claims filed by the importers was one in which it was maintained that the machinery in question should be allowed to enter at the rates of duty applicable to "castings."

#### **Extracting Machines.**

The Customs Court has overruled a protest filed by J. C. W. Stanley, New York. A dispute arose concerning the classification of small extracting machines. The collector deemed the machines dutiable as manufactures of metal at the rate of 45 per cent. ad valorem. The importer maintained in his protests that the articles should be permitted to come in free of duty on the ground that they were "models of invention." Mr. Stanley made no appearance before the board and no additional evidence was submitted whereupon the customs tribunal overruled the claim.

#### **Cement Mixing Machines.**

The classification under the Dingley tariff law of cement mixing machines is under investigation by the Board of United States General Appraisers. The test case stands in the name of Thomas Prosser & Son, New York. It appears that Collector Stranahan classified the machines as manufactures of steel with duty at the rate of 45 per cent. ad valorem. A hearing was held last week before the Customs Court, and considerable testimony was submitted on both the side of the importers and the Government. Prosser & Son, through their counsel, maintained that the collector had erred in his classification, and that the machines were properly dutiable at the lower rates provided under the provision for "steel castings." As soon as the record in the case has been written up the board will consider the testimony and formulate a decision. It is understood that domestic manufacturers of cement mixing machines are not desirous of having any reduction made in the duty.

### Pacific Coast Business Conditions.

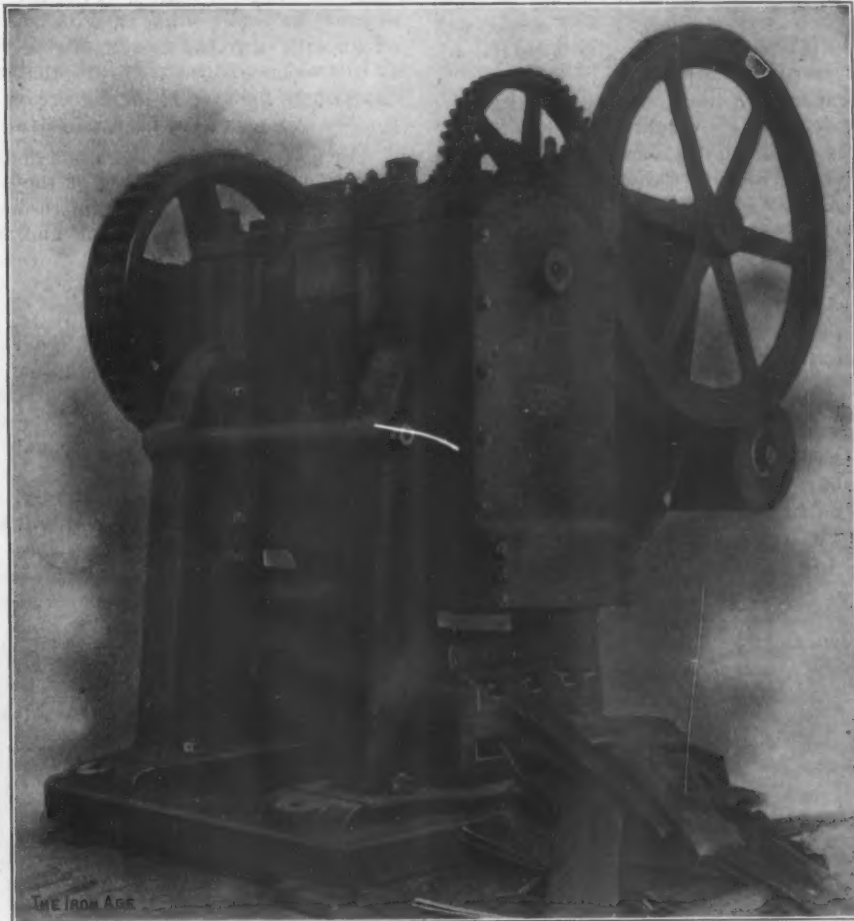
SAN FRANCISCO, CAL., September 16, 1905.—One of the most important matters of interest in commercial circles in San Francisco at the present time consists in the reported extensive deposits of tin near Cape Prince of Wales in Alaska. If these reports are true the deposits constitute a bonanza greater than any of those that have been exploited in this State or in Nevada. A company with large capital has been formed in this city to work these deposits and title to the most valuable of them has been obtained by it. Should the outcome be as stated by those who have been floating the stock of the company among our capitalists and business men the result will be a great accession to the wealth of this community.

The harvest is now over in this State and is progress-

ing. In the week now closed, for instance, the value of contracts recorded for new buildings at the City Hall may be roughly set down as \$1,000,000, being strongly in contrast with that of the previous week, which was only about one-fourth the sum. Of this \$600,000 was for the Crocker Hotel. A very large amount of iron and steel, structural steel and building hardware, &c., will be used in connection with the buildings the contracts for which have been recorded this week. The hardware houses in the city as a rule report a rushing business. J. O. L.

### A Combined Pipe Crushing and Shearing Machine.

In scrapping old pipe it has been the practice to crush the pipe under a press or steam hammer and then take



A New Machine for Simultaneously Crushing and Shearing Pipe, Made by the United Engineering & Foundry Company, Pittsburgh, Pa.

ing finely in Oregon and Washington. In both these States the outcome will be much more satisfactory than in California. Here we have about 450,000 tons of wheat, of which the greater part will be needed for home consumption. Most of the wheat that is coming to market in San Francisco to-day is from the north. Nearly one-fourth of the harvest year is over and the exports of wheat from this port are insignificant, not exceeding 32,000 bushels altogether. We have done better in barley, and shipments are beginning to be reasonably brisk, considering that this has been a backward year. The price of both wheat and barley has kept up very well, all things considered, and the returns will be much larger proportionately than in former years.

The activity in building operations has been unprecedented and still remains so. This is particularly the case in San Francisco and Los Angeles. While the latter is forging ahead at a proportionately quicker rate than San Francisco the amount of contracts for buildings in the latter city keeps steadily in the lead, and when one week seems to fall off the next invariably makes up for

it to another machine and shear it to proper lengths. A new machine made by the United Engineering & Foundry Company, Pittsburgh, Pa., performs both of these operations simultaneously, thus saving extra handling of the material and also, it is claimed, reducing the labor and power required about one-half. The machine may be used for crushing alone if so desired, the pipe in this case being fed in at the side of the machine instead of the end. The machine is arranged so that all the gearing and driving mechanism is overhead, leaving a clear space around the entire machine for the operator to work in. This effectively facilitates easy and rapid handling of material.

The combined pipe crushing and shearing machine is shown in the accompanying illustration arranged for motor drive. It is furnished either for direct connection to steam engines or electric motors or for belt drive.

Lake Titicaca, the largest lake in Peru and the highest navigable lake in the world, is to be tapped for the purpose of securing electric power.

## Fly Wheel Explosions.\*

Engine fly wheels may be divided into two general classes, those that serve as a fly wheel only and those that serve as a combined fly wheel and belt wheel. As a fly wheel the combined wheel prevents sudden fluctuations of speed due to variations in the load on the engine and to variations in the crank effort. As a belt wheel it serves to transmit the power developed by the engine. High speed is greatly desirable for either of these purposes. It allows narrow belts to be used, because the transmitting power of a belt is proportional to its width and to its speed. If the speed of a belt be doubled it need be only one-half as wide to transmit the same amount of power. High speed also allows lighter wheels, because a narrower faced wheel will serve to carry the narrower belt required. As the power developed by an engine increases directly with its speed, if the speed be doubled the power will be doubled and this without any increase in the steam pressure. If the engine and wheel will stand the increase in speed this will give also the advantage of better speed regulation.

A fly wheel's capacity to prevent sudden fluctuations of speed is proportional to its weight and to the square of its speed. If the speed can be doubled only one-fourth the weight will be required to give equally efficient speed regulation. Even a slight increase in speed means a considerable saving in the weight and cost of the wheel and the cost of the belting, and in an overloaded engine it may mean saving the cost of a larger engine to develop the power required. The temptation to run fly wheels at high speed is, therefore, great, so great, in fact, that they are often run at a speed dangerously near the limit of safety.

### Causes of Fly Wheel Accidents.

Wheels that serve only as fly wheels have narrow, thick rims, often of approximately square cross section. Those that serve as combined fly wheel and belt wheel have thin rims, wide enough to carry the belt required. Such wheels may fail primarily from two causes, overload or overspeed. Overload may be produced by clogging of the machinery in the mill, the forcing of an unusual number of machines at the same time, careless or ignorant handling of friction clutches, a short circuit if the engine drives electrical machinery, and sudden stoppage of the engine, as when the piston comes off and blocks the piston rod. In many instances the overload is produced suddenly and causes the wheel to fail either by the torsional strain produced or by the crushing strain due to the pressure of the belt acting against the rim.

Overspeed causes the wheels to explode by centrifugal force. By overspeed is not meant high normal speed, although many wheels are run normally at dangerous speed, but accidental increase in speed beyond that for which the governor is set and which is commonly called "racing." Racing may be produced by an improperly designed governor, slipping or breaking of governor belt or governor pulley, derangement of governor by internal or external causes, as when a stem or a rod gets stuck or a ball gets broken off; derangement of valve gear, improper setting of safety stops or blocking of governor and sudden reduction of load, as when the main driving belt breaks or an armature burns out.

Besides the primary causes there are contributory causes, such as defects in the design, material or construction of the wheel; failure of some part of the engine, as when its bed breaks or its shaft fails and throws the wheel against the side of the wheel pit, and deranging of the governor or valve gear by fragments from a broken idler or driving pulley.

In a condensing engine racing often continues until the wheel is disrupted, even after the engineer has succeeded in shutting off the steam. Unfortunately, when an engine starts to race the men in charge of machines in the mill shut them down, and the decrease in load causes a further increase in speed until the engine, en-

tirely freed of its load, runs away and bursts its wheel by centrifugal force.

### Stress in Fly Wheel Rims.

The stress in the rim of a fly wheel due to centrifugal force is represented by the formula

$$F = \frac{W V^2}{286} \dots\dots\dots I$$

from which the stress tending to burst the rim may be obtained for a wheel made of any material and running at any speed. As a cubic inch of cast iron weighs about 0.26 pound, for cast iron wheels the formula becomes

$$F = \frac{V^2}{10} \text{ approximately } \dots\dots\dots II$$

From either of these formulae it is seen that the stress in the rim of a wheel increases with the square of the speed, or the margin of safety on speed is always the square root of the factor of safety on strength. If the speed be tripled the stress in the rim becomes nine times as great as before—that is, with a factor of safety of 9 on strength there is a margin of safety of only 3 on speed. It will be understood from this that the stress increases enormously for even a slight increase in speed.

### Speed at Which Bursting Occurs.

For a given material there is a definite speed at which disruption occurs regardless of the amount of material used. This is not an uncertain theory but a mathematical truth easily demonstrated and is expressed by the formula

$$V = 1.63 \sqrt{\frac{S E}{W}} \dots\dots\dots III$$

in which  $V$  is the velocity of the rim of the wheel in feet per second at which disruption will occur,  $W$  the weight of a cubic inch of the material used,  $S$  the tensile strength of 1 square inch of the material and  $E$  the efficiency of the rim joint. ( $E$  equals 1 for wheels without rim joints.)

If instead of the ultimate strength of the material we take its safe strength the result will be the rim speed in feet per second at which the wheel may be run with safety, the supposition being, however, that the rim is made in one piece, is of homogeneous material and is free from shrinkage strains.

### Cast Iron Wheels.

In applying the formula to determine the safe rim speed for cast iron wheels made in one piece, assuming the ultimate strength of small test bars to be 20,000 pounds per square inch, large castings could be depended upon for 10,000 pounds. Using a factor of safety of 10 would give 1000 pounds per square inch as the safe strength of this material. The weight of a cubic inch of cast iron being approximately 0.26 pound, for cast iron wheels

$$V = 1.63 \sqrt{\frac{S}{W}} = 1.63 \sqrt{\frac{1000}{0.26}} = 100 \text{ feet per second } \dots\dots\dots IV$$

so that perfectly sound cast iron wheels made in one piece and free from shrinkage strains may be run with ample safety at a rim speed of 100 feet per second, which corresponds to about 1.15 miles per minute.

Small cast iron wheels are made in one piece. Large wheels are made in halves or sections to facilitate handling and transportation. It is common practice to make all engine wheels up to 8 feet in diameter in one piece, those between 8 and 16 feet in halves and those over 16 feet in sections, the number of sections being usually equal to the number of arms in the wheel. Wheels are not often made larger than 30 feet in diameter, although 30 feet is a size frequently encountered. Wheels smaller than 8 feet are frequently made in halves, either to avoid shrinkage strains or to enable them to be placed on their shafts without first having to take off other wheels. Frequently the hub only is split to obviate shrinkage strains.

This difficulty of shrinkage strains is serious and formerly led to the expediency of making the arms of small wheels in fantastic curves, often shaped like the letter "S." Shrinkage strains are produced by the unequal cooling of the arms and rim when the wheel is cast. If the mass of metal in the arms, for example, is pro-

\* Abstract of an article in *Insurance Engineering*, by Wm. H. Boehm, superintendent department of fly wheel insurance, Fidelity & Casualty Company, New York.

portionately greater than that in the rim—a frequent case with thin rimmed pulleys—the rim, because of cooling and shrinking first, is pulled upon by the more slowly cooling arms, thus producing a bending strain in the rim and a tension strain in the arms. This unequal cooling not only creates enormous shrinkage strains in the wheel but also leaves the metal at the juncture between arms and rim in a dangerously porous or honeycombed condition, caused by the tendency of the arms in cooling to pull away from the rim while the metal is in a plastic or half molten state.

#### Rim Joints.





Rim joints are a constant source of danger and should receive careful consideration, as will be appreciated when it is remembered that the usual bolted and flanged rim joints, located between the arms of sectional belt wheels, average a strength of only 20 per cent. of the solid rim, and that it is not possible to design a joint of this kind having a strength greater than 25 per cent. of the solid rim. By placing the joints at the ends of the arms instead of between them an efficiency of 50 per cent. of the strength of the rim may be obtained, because the centrifugal force of the heavy flanges and bolts is directly sustained by the arms instead of being left free to act as a bending force on the rim. In heavy, thick rimmed balance wheels, where steel links are shrunk on to reinforce the joint, an efficiency of 60 per cent. is possible, but this construction cannot be applied to belt wheels having thin rims.

#### Speeds That May Be Considered Safe.

Assuming rim joints designed for the greatest possible strength and using the formula previously given the allowable number of revolutions per minute for the several types and sizes of cast iron fly wheels in current use is given in the following table:

#### SAFE SPEEDS FOR CAST IRON FLY WHEELS.

Margin of safety on speed, approximately three.\*

| Diam.<br>in<br>Ft. | Type of Wheels and maximum obtainable efficiency of rim-joint.                      |   |   |   |
|--------------------|---|---|---|---|
|                    | No joint.<br>1.00   | Flange joint.<br>.25  | Pad joint.<br>.50   | Link joint.<br>.60  |
|                    |  |  |  |  |
|                    | R. P. M.  | R. P. M.  | R. P. M.  | R. P. M.  |
| 1                  | 1910  | 955   | 1350  | 1490  |
| 2                  | 955   | 478   | 675   | 740   |
| 3                  | 637   | 318   | 450   | 493   |
| 4                  | 478   | 239   | 338   | 370   |
| 5                  | 382   | 191   | 270   | 296   |
| 6                  | 318   | 159   | 225   | 247   |
| 7                  | 273   | 136   | 193   | 212   |
| 8                  | 239   | 119   | 169   | 185   |
| 9                  | 212   | 106   | 150   | 164   |
| 10                 | 191   | 96  | 135   | 148   |
| 11                 | 174   | 87  | 123   | 135   |
| 12                 | 159   | 80  | 113   | 124   |
| 13                 | 147   | 73  | 104   | 114   |
| 14                 | 136   | 68  | 96  | 106   |
| 15                 | 128   | 64  | 90  | 99  |
| 16                 | 120   | 60  | 84  | 92  |
| 17                 | 112   | 56  | 79  | 87  |
| 18                 | 106   | 53  | 75  | 82  |
| 19                 | 100   | 50  | 71  | 78  |
| 20                 | 95  | 48  | 68  | 74  |
| 21                 | 91  | 46  | 65  | 70  |
| 22                 | 87  | 44  | 62  | 67  |
| 23                 | 84  | 42  | 59  | 64  |
| 24                 | 80  | 40  | 56  | 62  |
| 25                 | 76  | 38  | 54  | 59  |
| 26                 | 74  | 37  | 52  | 57  |
| 27                 | 71  | 35  | 50  | 55  |
| 28                 | 68  | 34  | 48  | 53  |
| 29                 | 66  | 33  | 47  | 51  |
| 30                 | 64  | 32  | 45  | 49  |

\* If the revolutions given in the table be increased 20 per cent the margin of safety on speed will be reduced to two and one-half; if the revolutions be increased 50 per cent the margin of safety will be reduced to two.

In preparing this table a margin of safety of 3 on speed has been allowed, so that if the revolutions there given be multiplied by 3 the result will be the number of revolutions at which disruption will occur.

#### Wooden Wheels vs. Cast Iron Wheels.

Centrifugal force causes the majority of fly wheel wrecks. The rim velocity at which centrifugal force becomes sufficient to burst a wheel made of any given material has been given in formula III, an inspection of which shows that the bursting speed is proportional to

$\sqrt{\frac{S}{W}}$ . This means that the material which has the greatest strength for a given weight will stand the highest speed before going to pieces. Since wood possesses this quality it is in the above respect a better material for fly wheels than cast iron.

In comparing wheels having wooden rims, however, with those having cast iron rims it should be remembered that wooden rims are built up of segments fastened together. These segments are sawed so as to obtain as much of the straight grain of the wood as possible, but the full tensile strength of the wood is never obtained. Partly for this reason and partly for others a factor of safety of 20 is used for wood where 10 would be used for cast iron. Twenty in this case is, however, only an apparent factor of safety, because a part of the tensile strength lost in sawing is included in this, making the real factor of safety less than 20. The wooden segments are put together to break joints, so that the strength is further reduced one-half. This may be helped somewhat by arranging the segments so that only every third or fourth joint comes in line instead of every other joint, but if this is carried too far the contact surface on the sides becomes less and weakens the shearing strength of the segments.

Applying the formula to hard maple having a tensile strength of 10,500 pounds per square inch and weighing 0.0283 pound per cubic inch, using a factor of safety of 20, and remembering that the strength is reduced one-half, gives

$$V = 1.03 \sqrt{\frac{S E}{W}} = 1.03 \sqrt{\frac{525 \times 0.5}{0.0283}} = 154 \text{ ft. per second. } V$$

so that a well made maple wheel may be run with perfect safety at a rim speed of 154 feet per second, which corresponds to 1.75 miles per minute. Or comparing two wheels of the same diameter, one of cast iron and the other of maple, the number of revolutions per minute for the maple wheel may be 54 per cent. greater than for the cast iron wheel. One hundred and fifty-four feet per second would not, however, be a safe rim speed for wooden wheels if made in halves or sections, on account of the weakness of rim joints.

After a disastrous fly wheel wreck at the Amoskeag mills Charles H. Manning, superintendent of the mills, designed and had constructed a large wooden fly wheel. This wheel is 30 feet in diameter and 9 feet face. The rim is 12 inches thick and is built up of 44 courses of ash plank. The segments break joints and are glued and bolted together. There are two hubs and two sets of arms, 12 in each set and all of cast iron. The wheel weighs about 104,000 pounds and was tested to a speed of 76 revolutions per minute, corresponding to a rim speed of 1.36 miles per minute.

Since the construction of this wheel many large fly wheels have been built of wood. They are satisfactory in service, and several large manufacturing concerns now make a specialty of wooden fly wheel construction.

#### Steel Wheels.

Steel is a superior material for the construction of wheels of large size. Unfortunately, the extreme cost of such wheels precludes their general adoption. Notwithstanding this, steel as a material has plenty of advocates, some engineers going so far as to say that it is the only fit material for large fly wheels of high speed and high power.

In comparing steel wheels with wheels made of other materials it should be remembered that no wheel is ever stronger than its weakest section. As the rims of these wheels are built of plates cut into segments and riveted together the weakest section is not necessarily at a rim joint, although usually so.

Assuming an efficiency of 50 per cent. in rim joint and that no section of the rim has a net area less than

50 per cent. of the gross area of the cross section, and using a factor of safety of 10, steel having a tensile strength of 60,000 pounds per square inch would allow a safe rim speed of

$$V = 1.63 \sqrt{\frac{SE}{W}} = \sqrt{\frac{6000 \times 0.50}{0.28}} = 188 \text{ ft. per second.} \dots VI$$

corresponding to 1.9 miles per minute. Thus steel wheels will stand a speed 90 per cent. greater than cast iron wheels.

Steel wheels may be divided into three distinct types—those having center and rim built up entirely of steel plates, those having cast iron center with steel rim and those having cast steel center and plate steel rim.

A steel wheel of novel construction was recently designed by Mr. Manning. The wheel has a cast iron center and steel rim. The rim, however, is not built up of segments, but is made of rings, or hoops, one within the other, all securely riveted together. In describing this wheel Mr. Manning says it is stronger than steel wheels made of segmental plates and is also cheaper, because the material is not wasted in cutting. The wheel is 15 feet 3 inches in diameter and 36-inch face.

Steel wheels for extreme speeds have been constructed by winding steel disks with wire. Such a wheel is in operation in a rolling mill at Ladore, Wales, using the Mannesman process of rolling tubing from the solid bar. As an immense amount of power is required for only a short interval the wheel is subject to heavy shocks as well as to high speed. In constructing this wheel two steel disks 20 feet in diameter were bolted to a cast iron hub. The outer edges of the disks form a groove into which 70 tons of No. 5 steel wire are wound under a tension of 50 pounds. This wheel is operated at 240 revolutions per minute, which corresponds to a rim speed of 2.85 miles per minute. The wheel replaced by this one and which was made of cast iron in the usual manner broke at a rim speed of 1.42 miles per minute.

### Electrification Projects at Duluth.

Both the General Electric and Westinghouse Electric companies are now engaged in formulating plans for the electrification of Proctor Hill, on the Duluth, Missabe & Northern Railroad. This is a 2 per cent. grade for about six miles, running from the shipping docks of the company on the harbor of Duluth to the terminal and transfer yard of the company at Proctor, Minn. Loaded ore trains from the mines are run to Proctor and there taken by switch engines down to the docks. The same engines bring back empty cars, which are made up for the return trip to mines at Proctor yard. About 2500 horse power will be required for handling trains on this grade, and if arrangements are made with either company for an installation the power will be furnished by the Great Northern Power Company, which is now building its hydro-electric works at Duluth. It is not yet determined whether alternating or direct current will be used in this work.

The same companies are now working out plans for the possible electrification of the Duluth-St. Paul line of the Northern Pacific Railroad. This line connects Duluth and Superior with Minneapolis and St. Paul and is about 165 miles in length, with a very heavy freight and passenger traffic. With the exception of a 1 per cent. grade out of Duluth, and slightly steeper entrance into St. Paul, the line is reasonably free from gradients. It is one of three steam lines connecting these cities and carries an immense amount of coal and package freight as well as some grain, and runs several passenger trains each way daily.

The second project is not so sure as the first and may not come for a considerable time. The successful electrification of the Duluth, Missabe & Northern's terminal line will mean that electrical railroading will be extended to the entire length of that line as well as to both the other roads reaching from the iron ore ranges to Duluth. Then, too, both companies, looking toward the electrification of mines and mining plants on the iron

ranges of Minnesota, have had engineers in the district. These have been acquainting themselves with power plants and requirements and noting the conditions under which work will have to be done as well as with the class of power needed and its continuity.

### Ogden Desires New Industries.

William Glasmann, Mayor of the city of Ogden, Utah, and editor of the *Morning Examiner* and *Evening Standard*, was a visitor to New York last week. He stated that he had been elected chairman of a committee composed of business men of his city formed for the purpose of bringing the manufacturing advantages of Ogden to the attention of those who are looking for a promising location. He sets forth among the advantages of that location that it is only 40 miles from deposits of steam coal and 150 miles from deposits of coking coal, while iron ore is found in abundance within 30 miles. The city has already in operation a sugar beet factory of 500 tons daily capacity, 11 canning factories, the largest railroad machine shops between the Missouri River and the Pacific Ocean and a number of other enterprises employing many hands. The locality has an abundance of pure water, which is a great advantage in that part of the country. It enjoys a location on four railroads—namely, the Southern Pacific, the Union Pacific, the Rio Grande and the Oregon Short Line. In railroad parlance it is a common point and rates are quoted on all these lines with that consideration in view. The city has a population of 25,000 and serves as the distributing center for a very large territory. The population within a radius of 500 miles is over 500,000. The committee is offering inducements for the location of factories, and a strong effort will be made to secure such as seem to offer substantial possibilities and at the same time propose to engage in lines which meet the business requirements of that part of the country. Walter Wedell is secretary of the committee.

### The Buffalo Foundrymen's Association.

On September 19 the first regular monthly meeting of the Buffalo Foundrymen's Association following the customary summer recess was held in the association's new and commodious quarters, 685-687 Ellicott Square. President Lyman P. Hubbell was in the chair, with 26 members present. The following applications for membership were acted upon favorably: American Locomotive Company (Brooks Works), American Malleables Company, Niagara Foundry Company, Lake Erie Engineering Works, McKim Foundry & Machine Company and F. B. Howell. The association now has a membership of 35 foundry firms and is in a very healthy and prosperous condition.

As a special feature J. C. Bradley, general superintendent of the Pratt & Letchworth Company, gave an informal talk on "The Selection and Training of Apprentices," which proved to be one of the most instructive and entertaining that the association members have ever had the pleasure of listening to. With twenty-five years' experience in the molding business as a basis for his remarks Mr. Bradley entered into his subject from the practical viewpoint of personal interest in apprentices.

He explained in detail the method adopted by his firm through which it selects, educates and turns out many of the most proficient molders in this country. His great success in this particular work is due to the personal interest he takes in the boys in first selecting those who show an ambition to succeed and educating them to appreciate the advantages of the molder's trade. He does not place them in charge of a molder who does everything in his power to discourage them and takes little or no interest in them, but sees to it himself that they are advanced and educated in all branches of molding, so that when they have completed their apprenticeship they are qualified to do high class molding and earn top wages.

### The Standard Gas and Gasoline Pumping Engines.

In rural districts or regions remote from public water supply the residents are obliged to pump their water for domestic purposes from wells or cisterns. It is only comparatively recently that small power outfits have been available for this work such as are not prohibitive on account of their first cost or the expense of operating. The Standard Pump & Engine Company, Cleveland, Ohio, manufactures for service of this character three sizes of small power gas or gasoline pumping engines, the construction and operation of which have been simplified with a view to minimizing the amount of attendance necessary. The sets are combined on one base, making them self contained and compact, so that they may be easily shifted in location and will take up the least amount of space. The pumps are designed to deliver against a constant high pressure without injury

space is limited and frequent changes of location are necessary. The machines are also very effective for fire service pumps, because they can be started instantly and will furnish a constant and high pressure.

The engines are of the four-cycle type. The entire cylinder and valve chambers are water jacketed in a way that avoids any joints between the water jacket chamber and the cylinder. The cylinder head is removable, giving access to the valve and spark plugs for cleaning and inspecting without disturbing any of the adjustments or the pipes leading to the engine. The crank chamber, in which the connecting rod and crank shaft revolve, is a separate casting fitted to the bed plate and secured with screws and dowel pins to insure accurate alignment of the gearing. The crank shaft is a steel forging and runs in long large bronze bearings. The fly wheels are taper fitted to the ends of the shaft and held in place by keys and drawing up nuts. The valves are of the vertical poppet type, made in one piece

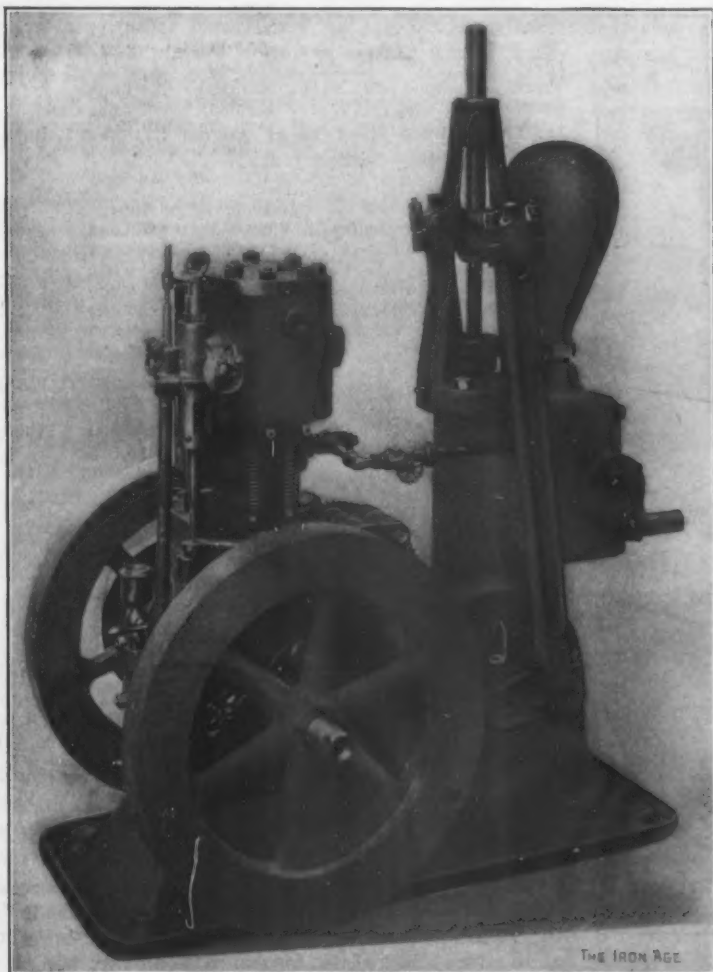


Fig. 1.—A 1½ Horse-Power Standard Gasoline Pumping Engine.

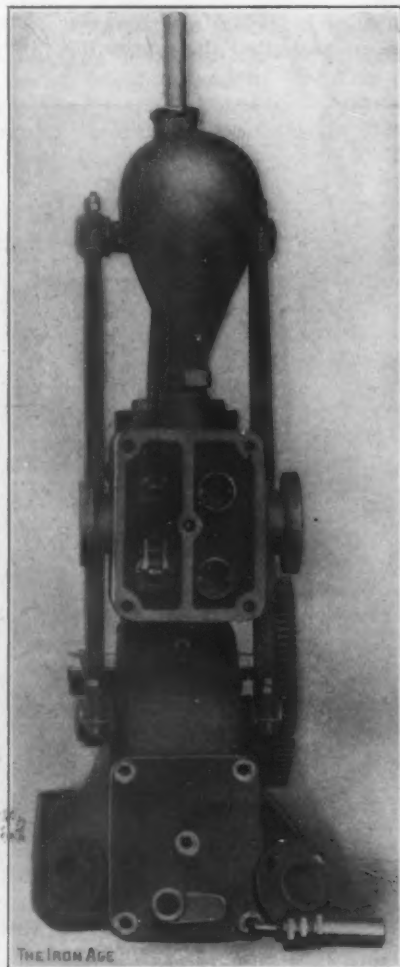


Fig. 2.—End View, Showing the Pump Valves.

to any of the parts or heating of the journals. The fuel used is gasoline or natural or artificial gas.

The accompanying Fig. 1 shows a set of 1½ horse-power, Fig. 2 shows a view of the pump end with the valve cover removed and Fig. 3 shows the engine removed from the base to show the driving connection between the fly wheel shaft and the crank shaft of the pump. The 1½ horse-power size has a capacity of 1200 gallons per hour. The other two sizes are 3½ and 5 horse-power pumping engines and have capacities of 3500 and 6000 gallons per hour, respectively. The smallest size pumps are particularly intended for house service or to be used by farmers and florists for irrigating and sprinkling. The larger machines are intended for railroad pumping stations, large greenhouses and nurseries for spraying and irrigating, for stock farms, summer resorts, &c. Being compact and self contained, they are also useful for mine and quarry pumping where

from drop forgings. The connecting rod is long to reduce the friction and strain upon it and is provided with means for taking up wear at each end. The cross head pin is carefully hardened and ground steel. The piston is very long and has five expanding rings, insuring good compression at all times. The engine cylinder is a separate casting of hard, close grained iron, and its water jacket is of ample size to secure an even temperature to all parts of the cylinder and valve chambers. A small pipe from the pump carries the cooling water to the jackets. The cams, rollers and pins are made from hardened steel, ground and polished to size. The valve operating shaft is driven by a steel pin meshing with a bronze gear, both of which are machine cut. The gears, exhaust valve cam and governor, connecting rod, crank shaft and piston are in the dust proof crank chamber and run in an oil spray which affords constant lubrication to all parts.

The ignition is by either an electric spark or a tube igniter. The electric igniter is of few parts and the plug is self contained. The tube igniter consists of an improved burner and a nickel alloy tube. Speed regulation is effected by a governor so arranged that an increase of speed prevents the opening of the fuel valve and at the same time admits air to cool and clean the cylinder. The same action of the governor stops the igniter, preventing needless waste of fuel and battery energy.

The pump section of this combination has been designed for durability and high efficiency. All of the gears and shafts are large and the bearings throughout are adjustable. The cylinders are cast iron or brass lined, as the work may require, and are fitted with metal expanding ring pistons for general service or hydraulic packed pistons for handling gritty water. The valves are of the vertical swing type, having removable brass seats and brass or rubber disks. The piston rod is made in one piece and has a brass sleeve over the part subject to wear. To allow a free passage to the water the valve chamber is made of generous size. The pipe connections are so made that the cap on the valve chamber may be

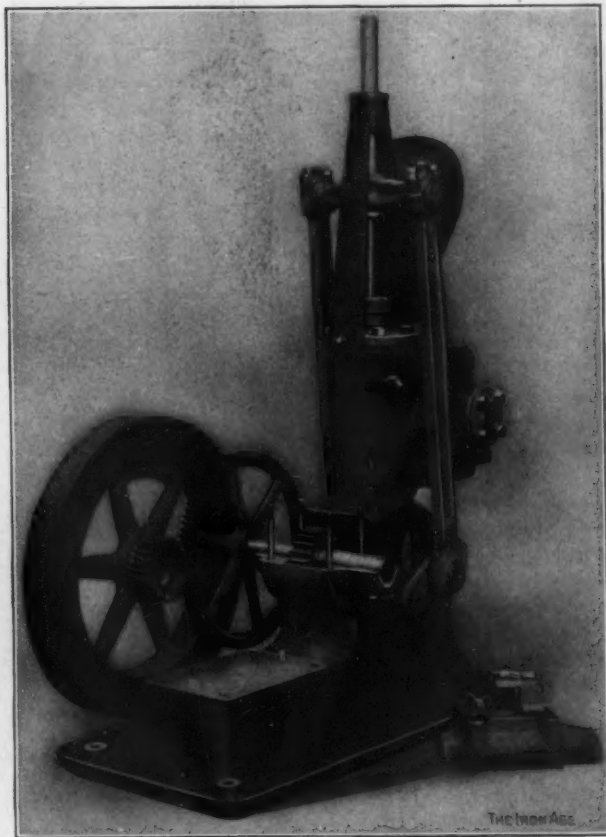


Fig. 3.—The Engine Removed from the Base to Show the Transmission.

removed, as indicated in Fig. 2, to allow inspecting and cleaning of the valves without disturbing the pipes.

In the cap of the pump valve chamber is placed an automatic safety by-pass, which obviates damage to the pump or pipes by an excess of pressure. The by-pass makes it possible to adjust the pressure to suit various requirements, so that the closing of one or all the outlets will not affect the pump, which will continue to run without attention, maintaining a steady pressure in the pipes. Resuming the discharge of water from any or all of the outlets causes the by-pass valve to close automatically. The pump may be disengaged from the engine by moving the gears out of mesh and the engine may be used for general power purposes.

The company also builds a deep well pumping jack for driving by a gasoline engine any deep well pump, wind mill rod or working head. This piece of apparatus is useful in places where the vertical lift, or suction, exceeds 25 feet, making it necessary to lower the cylinder and force the water to the desired elevation. The rig-

ging may be connected to the pump detachably, so that the ordinary method of operating can be restored in case of any disability to the pump.

Another equipment made by the company is a stationary deep well pumping engine, which is placed directly over the well and operates without the use of a pump standard. Both of these sets use the same engine that has been previously described. The engine is also made in portable equipments for power service and may be used for running farming machinery or small shop drives.

### The New Haven Iron & Steel Company.

This is one of the small iron and steel companies making public its report of the financial result of manufacturing operations. The information is therefore of value in showing general conditions. The report for the year ended August 31, 1905, compared with 1904 and 1903, is as follows:

|                           | 1905.     | 1904.     | 1903.       |
|---------------------------|-----------|-----------|-------------|
| Gross sales.....          | \$568,670 | \$369,112 | \$587,949   |
| Net profits.....          | 26,700    | 3,222     | 32,745      |
| Dividends .....           | 15,000    | .....     | 50,000      |
| Accounts charged off..... | 315       | 1,539     | .....       |
| Surplus .....             | 11,385    | 1,682     | Def. 17,055 |

The balance sheet as of August 31, 1905, compares with the three preceding years:

| <i>Assets.</i>               |           |           |           |
|------------------------------|-----------|-----------|-----------|
|                              | 1905.     | 1904.     | 1903.     |
| Plant and improvements.....  | \$369,083 | \$369,083 | \$368,846 |
| Materials on hand.....       | 111,035   | 106,065   | 88,635    |
| Cash on hand.....            | 7,561     | 9,303     | 37,679    |
| Organization and charter.... | 8,969     | 8,969     | 8,969     |
| Accounts receivable.....     | 57,287    | 45,420    | 54,270    |
| Bills receivable.....        | 12,735    | 8,729     | 13,738    |
| Stocks and bonds.....        | 48,826    | 48,826    | 48,826    |
| Totals.....                  | \$615,497 | \$596,397 | \$620,972 |
| <i>Liabilities.</i>          |           |           |           |
| Capital stock.....           | \$500,000 | \$500,000 | \$500,000 |
| Accounts payable.....        | 18,261    | 10,545    | 6,804     |
| Surplus .....                | 97,236    | 85,851    | 114,168   |
| Totals.....                  | \$615,497 | \$596,397 | \$620,972 |

President C. C. Kauffman in his accompanying remarks refers to the operations as having been satisfactory and profitable. He speaks hopefully of the outlook for the coming year, stating that the physical condition of the property was never better and that the equipment has been materially improved. In the last six years the company has made a total profit of 74 per cent. upon its capitalization and paid the stockholders in dividends a total of 53 per cent., which amounted to \$265 per share. The present excess of quick assets over current liabilities is equivalent to \$219 per share of stock exclusive of the value of the real estate and plant.

An interesting statement concerning the resources of life insurance companies and national banks in the United States was made by D. P. Kingsley, vice-president of the New York Life Insurance Company, before the National Association of Life Underwriters at Hartford, Conn., on September 19. The following statistics were cited in support of the speaker's assertion that life insurance interests have not grown so great as to be a menace and have barely kept pace with other branches of modern business. The assets of the life companies reporting to New York State doubled between the close of 1896 and the close of 1904 from \$1,228,000,000 to \$2,454,000,000. Insurance in force went from \$5,000,000,000 to \$10,000,000,000. At the close of the Spanish war the total national bank circulation was \$240,000,000. In seven years this has expanded 110 per cent. In the same time the resources of national banks have increased from \$4,000,000,000 to \$7,300,000,000. The resources of other banks increased from \$4,500,000,000 to \$9,000,000,000; while the cash holdings of all banks increased during that time \$570,000,000.

Reports submitted by the traffic officials of the Atchafalpa and Southern Pacific Railroad companies to their respective presidents show that the returns from the California orange industry now far exceed the annual gold output of the California mines

## The Acid Pickle for Iron and Steel.

The following is taken from an article by Charles F. Burgess on the "Action of Acids on Iron and the Use of the Acid Pickle" in the September issue of the *Electrochemical and Metallurgical Industry*:

The term "pickle" as used in the metal working industries is applied to acid solutions into which a metal article is dipped to free its surface of oxide, scale or crust or to give it a rough or matt appearance. While such dip is used in connection with the treatment of copper, brass, steel, iron and many other metals, it finds its most important application in the iron and steel industry.

Pickling constitutes an essential step in the well-known galvanizing process. Prior to immersing the sheet metal in the molten zinc it must be freed from scale and other oxides, and this is most satisfactorily accomplished by the use of the acid dip. To show something of the magnitude of this one operation alone it may be estimated that since 60,000 tons of zinc per annum are used in this country for galvanizing, the area of surface which is thus protected is approximately equivalent to 70 square miles, or 40,000 acres. The area which must be pickled in the manufacture of wire and sheet metal probably largely exceeds even this. Statistics show that about 1,500,000 tons of iron and steel wire were produced in 1903. Such an amount of iron in the form of wire possesses over 100 square miles of area, and since the process of pickling must be repeated several times during the operation of drawing, the pickled area is unquestionably larger than this amount. From figures taken from the United States Census Report for 1900 about 20,000,000 pounds of tin were used that year for the production of tinned sheets, and this, again, represents a second area of about 140 square miles which must be pickled, not once, but twice.

### Pickling in Wire, Stamping and Plating Works.

In the process of wire drawing rods about 2-10 inch in diameter are drawn through a series of round, tapering holes in a die, each hole being smaller in diameter than the preceding one. Prior to passing the rod received from the rolling mill through these dies it must be pickled to remove any scale, which would otherwise rapidly cut the die. After passing through a number of dies, varying from two to six times, according to the quality of the iron being drawn and the amount of reduction required, the metal becomes hard and brittle and annealing is necessary. This is accomplished by raising the iron to a red heat and allowing the temperature to fall slowly. In this process another scale forms on the iron and a second pickling operation becomes necessary.

The manufacture of iron stampings and cold rolled ware likewise involves repeated annealing and pickling of the product. In the production of enameled ware, enormous quantities of which are manufactured annually in the United States, the acid corrosion constitutes an important step in the operation, since the scale must be removed before the article is stamped into shape and again after it has been annealed that it may present a perfectly clean surface for reception of the enamel.

Pickling is also used by the electroplater in preparing his work to receive its nickel or copper coating, and it is likewise necessary for structural iron prior to painting, lacquering or varnishing of the metal surface. Many other applications of the process could be cited, but those given are sufficient to show that the action of acids on iron surfaces ranks among the most important problems with which the modern engineer has to deal.

In spite of the fact that this operation is by no means a modern one, and that those who use it form a numerous class of workers, no uniformity of practice seems to have been evolved. Each operator has a method of treatment peculiarly his own, the outgrowth of his personal experience and rule of thumb trials rather than of any general principles that have gained recognition. One operator will use hydrochloric acid, another will prefer sulphuric and a third will cling to certain mixtures. Not infrequently do metal plating es-

tablishments receive visits from an "expert" whose garb testifies to the material prosperity of the wearer and who offers for a certain bonus to divulge a secret formula by which the pickling department may double its output through the elimination of certain difficulties which hitherto had proved unsurmountable. Strange and wonderful are many of the recipes thus procured. One such which has been brought to the attention of the writer produced a pickle that when first set up undeniably proved to be most active, but for what purpose the majority of its dozen or more ingredients had been added was difficult to explain. Especially did the requirement of 2 per cent of whisky add to the mystery.

### A Minimum Effect on Underlying Metal.

An ideal pickle for removing scale and rust would be one which would remove the coating without attacking the underlying metal. To this end the acids must be so chosen as to exert a maximum solvent action on the oxide and a minimum solvent action on the iron.

According to Comey ("Dictionary of Chemical Solubilities") iron is readily soluble in most acids, particularly so in sulphuric and hydrochloric. Nitric acid also exerts great solvent action, unless in such degree of concentration as to render the iron passive. The rate of corrosion of acids varies with the concentration, increasing as the concentration increases up to a certain limit, after which the rate of corrosion decreases. This variation is sometimes very irregular. The temperature also has a marked effect, the activity of the acid increasing with the higher temperatures. This furnishes a reason for the common practice of heating pickling solutions. The increase of acid efficiency produced by heating is not uniform for all grades of iron, it being claimed that for charcoal pig and case hardened cast iron the increased rapidity of attack by boiling acids is less than for certain other grades of iron. The addition of soluble salts of copper, platinum and certain other metals greatly increases the action of an acid, while the addition of arsenic, it is claimed, almost entirely prevents the action of sulphuric and hydrochloric acid on iron.

According to the same authority the principal iron oxides to be considered are ferrous oxide,  $\text{FeO}$ ; ferric oxide,  $\text{Fe}_2\text{O}_3$ , and ferroferric acid, to which is assigned the formula  $\text{Fe}_3\text{O}_4$ . Ferrous oxide is easily soluble in hydrochloric and nitric acids, but nearly insoluble in sulphuric acid, even when heated. This oxide is, however, of minor import. Ferric oxide, an example of which is the ordinary brown rust, is attacked by acids with difficulty, the more so the higher it has been heated. Aqueous hydrochloric acid solutions when heated are given by Fresenius as the best solvents for this oxide, while Mitscherlich claims it is most easily soluble in 8 parts of sulphuric acid to 3 parts of water. By far the most important oxide with which the pickler has to deal is the black, or magnetic, oxide, to which the definite formula  $\text{Fe}_3\text{O}_4$  is commonly ascribed, but which is sometimes considered as being a mixture of  $\text{FeO}$  and  $\text{Fe}_2\text{O}_3$ . The only solvent which Comey gives for this oxide is hydrochloric acid.

It will be seen that the oxides of iron are much more resistant to the action of acids than is the iron itself, so that the principal desideratum of an ideal pickle cannot be attained through their use. To remove the oxide we must depend to a large extent upon the action of the acid on the metal which underlies the oxide, thereby loosening it so that it falls off or is left readily removable by physical means.

The black oxide, which is always formed when iron is heated in the presence of air or other oxidizing agents, presents various physical characteristics determined by the degree of heating, the length of time and the properties of the underlying metal. It may form under some circumstances a thin, filmlike and strongly adhering coating and in other cases it may create thick scales, which can be detached by hammering, rolling or other mechanical means. While this coating usually presents a continuous appearance to the naked eye, when carefully examined under the microscope it will be found to be perforated by cracks or holes through which the acid can enter. The iron in contact with such scale is more readily attacked

by the acid than when the surface is entirely clean, since the black oxide is electronegative to the iron and sets up active electrochemical couples.

#### Practice in Pickling.

It must not be inferred from what has been stated previously that iron and steel manufacturers have not given extensive and systematic study to the matter of utilizing acids to their highest efficiency. In this country the leading producers of wire, sheet metal and structural iron have worked out economies in this detail of manufacture as well as in other steps of their processes and have thereby led the world in cheapness of production. There has been continual and careful comparison of acid consumption and methods, and through modifications of the operation necessitated by changes in the treatment of the steel previous to its pickling the quantity of acid required has been reduced materially, and this in turn has led to a saving in the metal itself, since the consumption of an acid means the consumption of a chemically equivalent amount of iron. This detail in manufacture has not, however, been the subject of wide discussion before engineering societies nor has it been given the same degree of publicity accorded other features of the manufacturing processes.

Choosing at random information to be found in various technical books and publications we can readily see the differences in practice which prevail among the various users of the pickling operation.

In describing the Cowper-Cowles process of electro-galvanizing (*Electrochemical Industry*, March, 1903, p. 263) it is stated that the removal of mill scale from forgings and plates has always been a matter attended with much difficulty. The pickle recommended is 1 part sulphuric or hydrochloric acid to 10 parts of water, the period of immersion ranging from one-half hour to 20 hours. It is asserted that the British Admiralty specifies that all steam pipes, boiler and collector tubes and all plates for boilers shall be pickled in a liquid containing 1 part hydrochloric acid to 10 parts of water until all black oxide is removed.

According to Marks ("Manufacture of Iron and Steel Tubes") the process to be used involves the employment of a weak acid solution, consisting of 1 part hydrochloric acid to 30 parts of water. Brannet ("Metal Workers' Handy Book") asserts that for cast iron and wrought iron articles a mixture of 1 part sulphuric or hydrochloric acid and 10 parts of water, to which some tar has been added, should be used.

Randau in his work on "Enamels and Enameling" says that the usual strength of acid pickle is 1 part of commercial sulphuric acid to 20 to 22 parts of water, the time of immersion depending upon the strength of the pickle. If the exposure is not to be more than from 10 to 12 hours a stronger pickle is used, and as a rule the ware should not be allowed to remain in the pickle for more than 24 hours. When the ware is left too long in a pickling liquid that has been in use for some time and has consequently taken a relatively large amount of iron into solution the liquor forms in the presence of iron certain insoluble basic salts, which adhere firmly to the metal in the form of a soft powder, thus defeating the very object of the pickle. Such "overpickled" goods must then be scoured with sharp sand and pickled afresh. The solution should be operated at a temperature of from 30 to 40 degrees C.

#### Removing Mill Scale from Structural Steel.

Sabin ("Technology of Paint and Varnish") discusses the practice followed both in the United States and abroad relative to the removal of mill scale from structural iron prior to painting. The pieces are immersed in hot dilute sulphuric acid of a strength of from 25 to 28 per cent., some factories employing a 20 per cent. solution. To completely remove rust and scale will take from 6 to 12 minutes. Combinations of rust and scale are much more readily removed than the adherent blue or iridescent rolled scale alone. Where only the hydrated oxide is to be removed this is readily dissolved in a 10 to 12 per cent. acid. He states that in Germany it is customary to use a 9 or 10 per cent. acid, cold, leaving the metal in solution for five hours, but that

this requires a larger plant and offers no especial advantages. In subsequently washing the article by dipping it into water the iron becomes coated with a gummy or colloidal substance, the exact nature of which is not known, but which is very difficult to remove. To prevent the adherence of this substance it is recommended that the washing should be effected by using a jet of water which removes the material as rapidly as it forms. It has been suggested that this trouble may be due to the presence of arsenic in the solution, and for this reason many picklers in purchasing acid specify that it shall be free from arsenic.

He also states that it is often difficult and sometimes quite impracticable to pickle steel high in carbon or cast iron containing graphitic carbon, on account of the deposition of a film of carbon, like stove blacking, on the surface. Hydrochloric acid has been used instead of sulphuric, but it is not well suited to the purpose, being more expensive to procure and more difficult to remove. It also forms a gummy substance on the iron, which is worse than that produced by the use of sulphuric acid, and in the subsequent alkaline treatment it must be neutralized with caustic soda instead of with lime. After the iron has been freed from sulphuric acid by washing it with a jet of water it is put into a bath of lime water or milk of lime made boiling hot, a matter of great importance, and left there long enough for the metal to reach the temperature of the surrounding liquid. It is then removed to an oven and dried, after which the lime is brushed off. If desired the lime may be removed before putting the iron into the oven. In this case it will be found that the surface, which is perfectly clean and bright, rusts easily and quickly, whereas if the lime is removed by drying and brushing the surface it is less likely to rust. Even then, however, it rusts easily and should be painted immediately.

Sabin says that some of the largest work done recently has been treated in the following manner: The steel from the mill was put into a hot 10 per cent. caustic soda solution until all the grease and oil came off, together with dirt and a certain amount of scale, making a bulky sludge. Next the steel was washed in boiling water and put into a hot solution of sulphuric acid of 10 per cent. strength and left until the metal surface was completely exposed, after which it was dipped into boiling water, then into a hot 10 per cent. solution of carbonated soda, well washed and finally dried in the oven.

Harbord and Hall ("Metallurgy of Steel") say that where readily obtainable hydrochloric acid is preferable to sulphuric in the proportion of 1 part of acid to 1 part of water, since it does not require warming, and the sheets previous to galvanizing do not require to be soaked in water, but may be passed at once to the molten zinc bath after only a moment's drainage. The cost of pickling by either acid is stated to be about the same, the difference in the quantity required being equalized by the difference in price, but hydrochloric acid has the advantage of being quicker in its action and generating fumes which are less objectionable to the workmen.

It appears from this same work that the practice followed in the preparation of sheet iron for tinning is different from that used for galvanizing. The black iron is first subjected to what is known as the black pickle, in which sulphuric acid made from pyrites is used, the acid having a specific gravity of from 1.6 to 1.74 and being diluted with an equal amount of water. The sheets coming from this bath are washed in water and annealed and then rolled to give a smooth surface. They are then pickled again in a weak solution of sulphuric acid, made from burning sulphur to render it free from arsenic, which would leave black streaks on the plates.

In the electroplating industry even a larger number of problems arise in connection with the pickling process than in the industries heretofore cited, this being due to the greater variety in the kinds of iron which must be treated. A distinction is made ordinarily between dips and pickles, the first named usually consisting of undiluted acids or mixtures of acids, the purpose being to dissolve the coating substances while leaving the underlying

metal smooth and unattacked. Pickles, on the other hand, are diluted acid solutions designed to corrode the metal.

#### Dip and Pickle for Iron.

Hawkins, in his work entitled "The Polishing and Plating of Metals," which is a thoroughly practical account of the electroplating processes used in this country, recommends the following solutions:

For removing rust from iron or steel goods of any kind a dip of pure muriatic acid is used. Where the goods are not very rusty four or five minutes' immersion will be sufficient; if badly corroded, from 10 to 12 minutes will be required; but this dip will remove the rust no matter how thick without hurting the metal if the work is removed and thoroughly rinsed—first, in cold, then in hot water—and dried in sawdust as soon as the rust disappears.

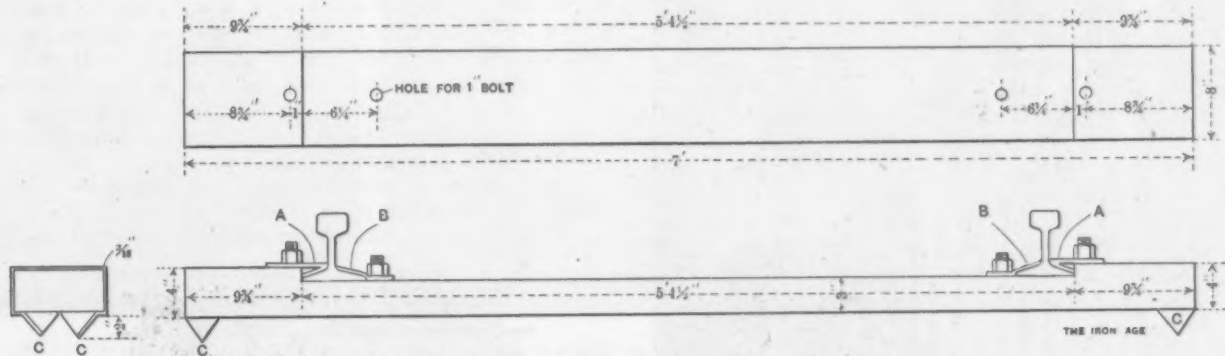
For a quick working pickle on rough iron castings use sulphuric acid in the proportion of 1 part acid to 4 parts water; for a slow acting pickle intended for smoother castings and stampings use 1 part sulphuric acid to 10 parts water. The amount of water may be increased still more in pickling very smooth pieces where little sand or scale is present. The pickle in every day use for castings and wrought iron goods consists of 1 part acid to 4 parts water. Generally it is used cold, but where large quantities of work are to be pickled

a test section of thirty of these new ties it was found at the outset that they were not at all likely to get out of alignment. After a few had been put down the foreman attempted to move the section slightly with levers, as is done with a section of wooden ties, but the track could not be budged until the ties were jacked up from the ballast. The ballast in this case was only dirt, and with rock ballast the hold would be even more secure.

The ties can be made for about \$2 each, including the cost of the bolts and clamps, and as they do away with the use of rail braces it is figured that steel ties are no more expensive than wooden ties, while they will last at least twice as long. They are laid with a spacing of about 30 inches between centers.

The trial section which has been put down offers splendid opportunities for proving the worth of the ties, as long trains of coke, ore and steel are passing over them continuously. Under these conditions it will take only a short time to determine their practicability, and if they continue to be as satisfactory as they have thus far been they will be laid on the entire Monongahela Connecting road.

**Another North River Tunnel.**—Announcement is made by John B. McDonald and Thomas M. McCarter, representing respectively the Metropolitan Street Railway Company, New York, and the Public Service Cor-



The McCune Steel Railroad Tie, Made by the Jones & Laughlin Steel Company.

and the saving of time is an object the operation will be hastened if the pickle is kept at about 150 degrees F.

Where castings contain silica and adhering sand a hydrofluoric acid pickle is used to considerable advantage. For a strong and quick acting solution 1 part acid to 15 parts water is used, and for a slower acting solution the quantity of water may be doubled.

#### The McCune Steel Railroad Tie.

A new steel railroad tie has recently been invented by Frank McCune, general superintendent of the Monongahela Connecting Railroad, Pittsburgh, Pa., owned by the Jones & Laughlin Steel Company. The accompanying engraving gives a dimension drawing of the tie for 85-pound rails of the American Society of Civil Engineers standard section. The tie is of rectangular section and is pressed from a sheet of 3-16 inch steel. For standard track the dimensions are preferably 7 feet long by 8 inches wide by 4 inches deep. Such a tie weighs only 97 pounds, as compared with 200 pounds, the weight of a wooden tie for the same service.

In the top surface of the tie there is a depression 1 inch deep extending from outside to outside of the rail flanges, which forms a seat and brace, effectually preventing their spreading and facilitating the accurate spacing of the rails in laying. The rails are secured by clamps and bolts. The outside clamps A are made of a strap 1/4 inch thick, 3 inches wide and 7 inches long, and the inside clamps are made of 1/4 x 3 x 5 inch straps. The clamps are bolted to the tie by 1-inch bolts with 1 1/2-inch square heads.

At the ends on the under side of the tie where the edges of the folded sheet meet the corners are turned down, forming projections C and C, which serve to hold the tie against displacement in the track bed. In laying

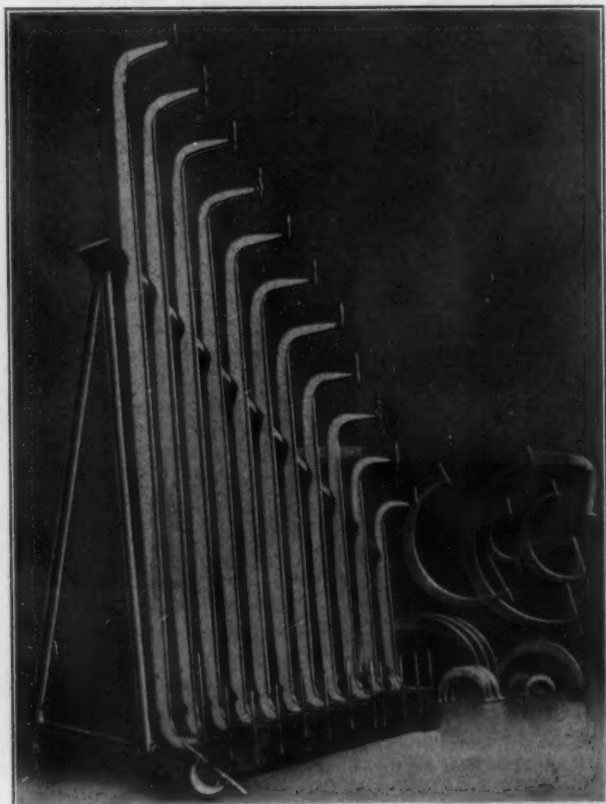
poration of New Jersey, that the Interstate Tunnel Railway Company of New Jersey has been incorporated with a capital of \$7,500,000. The company is to construct a tunnel under the North River from Jersey City to a terminus under Chambers street, between Broadway and the Brooklyn Bridge terminal in Manhattan. The Public Service Corporation will establish a direct high speed line from Newark without changes to the proposed tunnel in Jersey City, affording direct transportation from Newark to City Hall in New York in 15 minutes. Arrangements have also been made for a joint passenger station at Jersey City, where the Erie Railroad Company can transfer suburban passengers to the proposed tunnel line. Construction will begin as soon as the necessary rights have been obtained and application for such rights has been made to the Rapid Transit Commission. The new tunnel parallels the tunnel now under construction by W. G. McAdoo and believed to be controlled by Interborough interests. This indicates competition between the Interborough and the Metropolitan interests in New Jersey as well as in Manhattan.

The Abner Doble Company, San Francisco, states that the University of Michigan has purchased the tangential water wheel which it exhibited at the St. Louis World's Fair. This wheel is to be installed in the hydraulic laboratory of the new Engineering Building at Ann Arbor, Mich., where it will be mounted in connection with a duplex pump for experimental purposes, its output being 100 horse-power when operating under a head of 580 feet. Orders have recently been received from the University of Wisconsin, the Michigan School of Mines and the University of Toronto for 12-inch laboratory water motors, such as the company builds for technical schools and universities.

### The Davis Tubular Micrometer Calipers.

Frank M. Davis & Co., Milwaukee, Wis., are placing on the market a new line of micrometer calipers, in which the body of the tool is tubular. The calipers are made in two styles, bow and bar, the former being crescent shaped and the latter extended U shape, as shown in the illustration. Cold strips of No. 18 B. & S. gauge sheet steel are used, these being cut into blanks of the necessary shape, and formed into oblong tapering tubular bows or bars and well brazed. Drop forgings are brazed and riveted into the ends. The construction gives the greatest possible stiffness for a given weight.

The bow calipers are made up to 72 inches span and the bar calipers up to 20 inches. The latter are intended for measuring pistons, cylinder heads, gears and all work that can be measured across the diameter. For measuring interior diameters of cylinders, &c., the instrument can be made an inside caliper by reversing the micrometer



The Davis Tubular Micrometer Calipers.

and mandrel in the frame. It is possible to measure cylinders while being bored as the caliper will span the boring bar.

The advantage of the tubular form of frame is that the resulting lightness of the caliper permits its use for more delicate work, particularly on large spans, than would be possible with the heavier tools having solid frames. The same company makes a spacing tool which has a capacity of from 1 to 24 inches radius.

The Tennessee Coal, Iron & Railroad Company on Wednesday, September 20, established what is believed to be a world's record for a twenty-four hour run on a 50-ton open hearth furnace. On the day mentioned five heats, or a total of 202,142 gross tons, of steel were tapped from No. 6 furnace of the Ensley plant. The metallic charges used were composed of hot metal first treated in a Bessemer converter. The furnace was working on coal gas.

British trade reports state that the Steel Company of Scotland has secured in competition with American, French and German firms large contracts from two foreign Governments for steel plates, deliveries extending over two years.

### A New Multiple Molding Process for Relatively Deep Work.\*

BY E. H. MUMFORD, PHILADELPHIA.

There is nothing new in multiple molding as it has been practiced for years, but the process developed by A. K. Beckwith, Dowagiac, Mich., in the foundry of the P. D. Beckwith Estate, has novel features which I consider well worth the attention of the foundry trade. Fig. 1 shows what is called the receptacle, with the

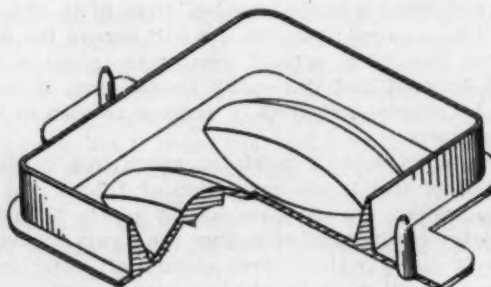


Fig. 1.—The Receptacle, Showing Upset.

patterns for the drag face of the mold on a match plate which is surrounded by an upstanding ring, or upset. This upset measures the amount of sand which is to be forced into the double faced flask in forming the mold section of the multiple mold stack, and the sand is riddled into the receptacle and struck off flush with this edge. Over this struck surface of sand is then placed a cover plate of thin sheet metal, which is quickly secured so as to keep its place and retain the sand when the receptacle is inverted.

Fig. 2 shows a section through the receptacle and flask with the cover plate between the two. Fig. 3 shows the same elements with the cover plate withdrawn

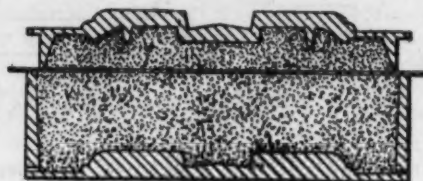


Fig. 2.—Cover Plate Between Sand Surfaces.

and the two sand surfaces in contact ready for ramming, while the patterns which form the cope face of the mold section appear at the bottom of the flask.

Fig. 4 is a general view of the apparatus, the cope patterns on the power ramming machine on a match plate, the drag patterns in the receptacle on trestles at the left, and, to the left of that again, the cover plate.

Fig. 5 shows the flask on the match plate on the machine, filled with sand and struck off, the receptacle also filled with sand and struck off, while the operator stands

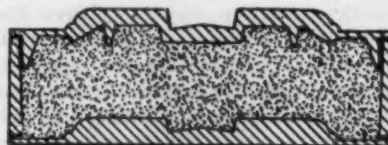


Fig. 3.—Plate Withdrawn and Surfaces in Contact.

with the cover plate in his hands ready to place it over the receptacle to hold the sand while inverting.

Fig. 6 shows the receptacle inverted on its way to the mold section on the machine, the cover plate supporting the sand.

Fig. 7 shows the receptacle on the mold section with the cover plate withdrawn, ready for ramming.

Fig. 8 shows the finished mold section after the receptacle has been lifted from the drag face of the mold section while being rapped or vibrated and the mold section has been lifted in turn from the cope patterns

\* Address before the New England Foundrymen's Association, Boston, September 13.

on the match plate in the same way. The anomaly is at once apparent of the drag face of the mold being rammed in the top face of the flask. In the figure the operator is just placing the finished mold section on the stack of molds already formed. At either side appear

until provision was made for the speedy removal of the finished molds from the machine in such manner as to leave the machine operator free to keep the machine busy. This is accomplished in multiple molding by cutting down the space which the operator has to travel



Fig. 4.—View of Apparatus.



Fig. 5.—Ready to Place Receptacle.



Fig. 6.—Receptacle Inverted.



Fig. 7.—Cover Plate Withdrawn.



Fig. 8.—Placing Mold on Stack.



Fig. 9.—Molds Ready for Clamping.

#### NEW MULTIPLE MOLDING PROCESS.

the side rods for clamping the multiple mold together from top to bottom.

Fig. 9 shows a finished floor of multiple molds ready for top weights and clamping. It is clear from the figure that, while there are ten flasks, there are nine complete molds in the stack.

Fig. 10 shows the shaking out of a stack of molds, the same side rods used for clamping being used without change for shaking out the work. The stack of empty flasks is carried intact from the molding floor and placed alongside the machine ready for the next day's work without their being separated, by which process all the trouble of bent pins and broken flasks is avoided, to say nothing of the great saving in handling.

In response to a question Mr. Mumford said that while the making of the match plates might appear to some a burden upon the process it was really a simple and inexpensive matter, and he illustrated a method of making cast match plates with all the accuracy of machined plates so far as matching of patterns is concerned, by which method he said he had seen a single faced match plate finished ready for use on the machine as soon as it was cool in 45 minutes from the time the wooden master patterns were bedded in the sand to form the joint surface.

He stated he was quoting one of the brightest men in the foundry trade as well as stating his own convictions when he said that he believed multiple molding offered the greatest field for development of the molding machine in foundries not equipped with elaborate mold conveyors, and that in this field lay the greatest opportunities for original work. That there is much in this statement he made apparent by showing that the full output from power ramming machines was never reached

to and from the machine. Thus, when floor space is reduced 90 per cent., so is the distance for the man to travel, and, therefore, the time he is away from his work at the machine. When a man can stand continuously at his machine his output on certain lines of



Fig. 10.—Shaking Out a Stack.

machine molding is increased from about 20 molds per hour to 75 to 80 molds per hour. Not so large an increase in output is to be expected from multiple molding, but it is clear that the effect is in the same direction.

There are many small, irregular and more or less hollow and deep castings in stove work in which, in

order to form the drag face of the mold, the ramming must be done with the pattern in an inverted position—that is, with the pattern face down. The pattern must be filled with sand, pattern face up, and rammed against the sand forming the mold section against the cope pattern. There has never been before found a method of accomplishing just this thing, so important to successful multiple molding. The limiting depth of pattern which can be forced down into a struck surface of sand is soon reached, and the only way to properly ram deep pockets of sand and irregular surfaces which has been successfully used in manufacturing such work to date is that above described.

## The Raising of the Level of the Great Lakes.

The International Waterways Commission spent September 13 and 14 in making an inspection of the scenic and industrial features of Niagara Falls and that locality and in hearing representatives of power and other interests. This was deemed the most important meeting of the commission, and it received much attention from the several engineers who are connected with the development of power on both sides of the river as well as from the Commissioners of the New York State Reservation and the Commissioners of Victoria Park, the latter on the Canadian side. While no plan for raising the lake levels has been adopted, it has been understood that this commission would investigate the advisability of erecting a dam and sluices at the outlet of Lake Erie near Buffalo, and this suggestion, made some years ago, served to arouse all the Niagara interests.

The American members of the commission are Col. O. H. Ernst, George Y. Wisner and George Clinton, while the Canadian commissioners are Louis Coste, John P. Mabee and W. F. King. Louis C. Sabin is the secretary of the American board and Thomas Cote of the Canadian board. Colonel Ernst, as chairman of the meeting, read the act of Congress that authorized the appointment of the commission by the President. Among those present at the meeting were Commissioners Potter and Porter and Supt. Edward H. Perry of the New York State Reservation; Commissioner George H. Wilkes and Supt. James Wilson of Victoria Park; Attorney Lovelace, Supt. P. P. Barton, Resident Engineer Van Cleve, Third Vice-President De Lancey Rankine of the Niagara Falls Power Company, Mr. Van Cleve being also the resident engineer of the Canadian Niagara Power Company; Arthur Schoellkopf and Chief Engineer John L. Harper of the Niagara Falls Hydraulic Power & Mfg. Company; Patrick F. King, representing the Niagara, Lockport & Ontario Power Company, the Lower River & Water Supply Company and the International Power & Transmission Company; Banker R. Payne and Attorney Fred W. Hill, representing the Ontario Power Company; Beverley F. Value, engineer of the Electrical Development Company of Ontario, Ltd.; Mayor O. W. Cutler, representing the commercial interests of Niagara Falls.

Colonel Ernst first called on Mayor Cutler, who asked that the commission carefully consider the importance of the upper river navigation to the future of Niagara Falls and that no obstruction to navigation be placed in the stream.

Commissioner A. K. Potter of the New York State Reservation asked as a citizen and as an official of New York State that the Falls of Niagara be preserved. He argued that the Niagara River is not only a national boundary, but it is in contemplation of law, throughout its entire length, a navigable stream.

Commissioner Potter also presented a resolution adopted by the Commissioners of the State Reservation at Niagara Falls requesting the International Waterways commissions to urge upon their respective Governments the necessity of preventing the further diversion of the waters of Niagara River from their natural course over the Falls.

Commissioner Alexander J. Porter submitted to the commissioners a copy of an address by Charles M. Dow,

chairman of the Board of Commissioners of the New York State Reservation, which emphasized the importance of preserving the Falls of Niagara as a natural spectacle. He said that in 1868 the mean volume of the river was given as 273,329 cubic feet, and that for 36 years this had been the quoted figure, but the fact is that 224,000 cubic feet per second is the accepted figure, the equivalent discharge in horse-power being 3,800,000. He pointed out that the American and Horseshoe Falls will not be affected the same by future diversions of water, the stream being divided by Goat Island, which is 750 feet from the New York shore and 3750 feet from the Canadian shore, giving the Horseshoe Falls five-sixths of the flow and the American Falls one-sixth. But in addition to this the rock in the American channel is 10 feet higher than in the Canadian channel, which further lessens the flow to the American Falls. It is variously estimated that only from one-fifth to one-tenth of the water passes over the American Falls. It is figured that 78,396 cubic feet of water per second are required for the present power developments, leaving only 144,006 cubic feet to continue the spectacle of the Falls of Niagara. It was feared that the complete extinction of the American Falls and the serious reduction of the Canadian Falls are imminent.

### The Possibility of Niagara River Running Dry.

Commissioner Wilkes filed with the commissioners a report of Superintendent James Wilson covering the position of the Commissioners of Victoria Park of Canada. The opinion is expressed that should the dam be erected and a minimum elevation of the level occur all the sluice gates would be closed in response to the demands of the shipping interests in order to secure the restoration of the levels at Buffalo harbor. This would allow the river to run practically dry for the time being, a thing that should not be permitted under any circumstances, particularly when the whole object of the scheme appears to be to save dredging the harbors on Lake Erie and to facilitate the making of a 21-foot channel from the United States side of the Niagara River to Lake Huron, the cost of which, if the water was raised in Lake Erie, would be about \$1,375,000 less than would be required should the present conditions be allowed to remain. The report also stated that because of the construction of the Chicago Drainage Canal the water surface of Lake Erie has been permanently lowered about 4½ inches, and the volume of the Niagara River and all the waters from Lake Huron via the St. Lawrence to the sea has been likewise depleted.

Representing the Niagara Falls Power Company Attorney Lovelace presented data and expressed the belief that any artificial interference with the natural levels would be detrimental to Niagara, where outside of the big investments of the power companies there was about \$8,000,000 invested in new industries. Hon. Arthur Schoellkopf, an officer of the Niagara Falls Hydraulic Power & Mfg. Company, said that if any further obstructions were placed in the Niagara River his company would be unable to meet the demands of customers for power, which would mean great financial loss. The Ontario Power Company, Canadian side, promised to file a brief in the near future.

The Connecticut Valley Metal Trades Association of Springfield, Mass., and vicinity, and the Manufacturers' Bureau of Hartford County, Conn., united in a sheep-bake at Lake Compounce, Bristol, September 16. There was a representative attendance of the metal industry of these two sections of New England. A feature of the day was a ball game between Hartford and Springfield, which the former won by a score of 5 to 1. It is proposed that the bake be made an annual affair.

An advancing tendency in the British pig iron market is noted in late reports relating to foundry iron. Abandoning the hand to mouth buying of many months consumers are seeking to contract into next year, while producers are disposed to limit the amount of business at present prices.

### The Grönkvist Drill Chuck.

The Grönkvist drill chuck is a Swedish invention of simple and entirely new construction for which no wrench or other tools are required, only the fingers being needed to fasten or release a drill. The great benefit to be secured from the use of the chuck is the saving of time ordinarily lost in changing drills. In the regular procedure it is necessary to stop the machine, open the jaws, fit the drill into the chuck, close the jaws again and start the machine. With this new chuck the operator has only to grasp the chuck body while the machine is in motion, causing the rolls which constitute the gripping jaws to open outwardly, releasing the drill and allowing another to be substituted. The chuck is also claimed to be free of the objection common to many chucks operated by wrenches, that the jaws wear unevenly due to slipping of the drills, which cuts up the drill shanks. There are other objections to wrench or key operated chucks, such as the annoyance of not finding the wrench when it is needed, the wearing of the wrench holes and the likelihood of injuring the chuck by careless handling when it sticks.

Two sections of the chuck and the body removed are shown in the accompanying illustration. The chuck is held in the machine by a taper shank, after the manner

easily replaced. At present five sizes are made, the smallest taking drills of from 1-32 to 3-32 inch diameter, and the largest  $\frac{1}{2}$  to  $\frac{3}{4}$  inch drills.

The manufacturer of the chuck is the Grönkvist Drill Chuck Company, Jersey City, N. J., of which the sole representatives are Schuchardt & Schütte, 136 Liberty street, New York City.

### An Unusual Gas Engine Plant as Auxiliary to Water Power.

A paper by John Martin, read at the recent annual meeting of the Pacific Coast Gas Association, describes a noteworthy power plant now building for the California Gas & Electric Company. There will be three generating units, each of 4000 kw. capacity, the power end being a gas engine. The gas will be made from crude oil with a calorific power of 650 British thermal units per cubic foot, or slightly more than that of ordinary coal gas. The California Gas & Electric Company owns the well-known water-power electric long distance transmission system in Southern California.

The engines are in general arrangement of the twin tandem type and operate on the four-stroke or Otto cycle; each crank thus receives two impulses per revolu-

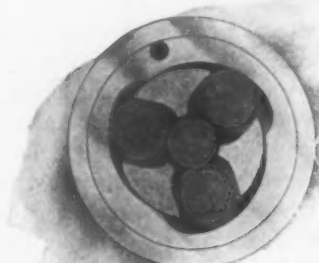
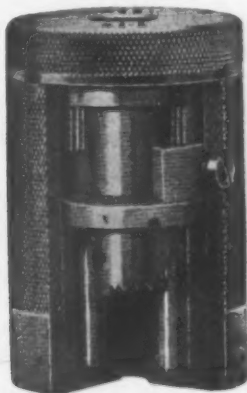
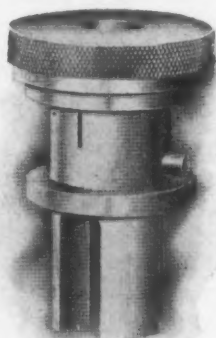


Fig. 1.—The Chuck Body

Fig. 2.—Broken Section of the Grönkvist Chuck.

Fig. 3.—Cross Section.

of the usual style of the chuck. It is perfectly round and smooth, with no protruding parts. The chuck body, shown in Fig. 1, has three side grooves and forms a support for the cylinder which constitutes the exterior part of the chuck proper, shown in Fig. 2. The latter has an opening to admit the drill shank, and the inside periphery at the lower end is formed with three eccentric curves, as shown in Fig. 3. In the grooves of the chuck body there are three rolls which serve as gripping members.

The chuck body has a taper hole in the hub to receive the shank. Around its entire circumference there is a spring, Fig. 2, one end of which is fastened to the body and the other to the cylinder. This spring tends to turn the cylinder in relation to the body, so as to cause the rolls, by contact with the eccentric ways, to converge laterally toward the center of the chuck. A drill shank being inserted will therefore be gripped automatically by the rolls and when the drill is in use the resistance to cutting tends to increase the gripping action of the chuck due to the friction between the drill shank and the three rolls. Consequently the heavier the work the stronger will be the grip upon the drill. Slipping of the drill is thus avoided and the limit to which the drill may be fed is determined only by the strength of the drill. When the rotating of the cylinder is retarded by grasping with the hand the chuck is caused to open, releasing the drill.

Among the advantages which are given for the chuck are that it has no jaws, no threads and no screws, and that it centers the drill automatically and instantaneously, so that the true running of the drill is always assured. The chuck has extremely long wearing qualities, but should any part be accidentally injured it may be

tion. The working parts are wholly above the engine room floor. The general design is developed for maximum accessibility, easy access to interior of cylinders and proper realignment in reassembling. Any cylinder head can be removed from its cylinder by disconnecting one jacket water supply pipe and removing the holding on nuts. Each cylinder is in two parts, with a circumferential joint half way between the ends.

The pistons are carried by cross heads to reduce the friction load on the cylinder walls. Each rod has three cross heads—main, intermediate and outboard—the piston rod being continuous from the main to the outboard cross head. The crank shaft has overhung cranks, integral with the shaft forging. The crank pins are forced into the cranks. Lubrication of the pistons is secured through four oil feeds to each cylinder, with individual oil pumps. Oil is pumped in on the admission stroke and is spread on the compression stroke. The journals are also lubricated by positive feed. The (multiple) oil pump allows of separate regulation of feed to each part supplied. The oil feed starts and stops with the engine.

The engines are started by compressed air stored in tanks. Speed limiting devices are fitted. Special attention has been given in the design of the engine to reducing the angular variation of speed to permit of parallel operation of the generators. The main dimensions of each of these engines are: Cylinders, 42 inches diameter by 60 inches stroke; main bearings, 30 inches diameter by 54 inches; long shaft, 38 inches diameter; fly wheel, 130,000 pounds; overall dimensions of engine, 70 feet long by 34 feet wide; total weight of engine (with generator), 600 tons. The engines are being built by the Snow Steam Pump Works of Buffalo, N. Y.

# THE IRON AGE

1855-1905.

New York, Thursday, September 28, 1905.

|                         |                 |
|-------------------------|-----------------|
| DAVID WILLIAMS COMPANY, | PUBLISHER       |
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## The Labor Union's "Right" of Compulsion.

In his address before the recent Boston convention of the International Association of Machinists President O'Connell said:

The employers' associations are leaving no stone unturned to misrepresent the position of the trades unions relative to what is commonly known as the "union shop." We do not interfere with the rights of any individual mechanic to seek employment where he will, but we do reserve the right to say with whom we shall work. If we secure through our efforts better conditions of employment we have a right to say that mechanics enjoying the results of our labors should contribute to the success of our organization in maintaining the improved conditions secured by us. If the machinists throughout our jurisdiction would organize as they should the open shop proposition would rapidly disappear, because the employer would quickly realize that the best mechanics, the most intelligent workmen and the most industrious citizens could only be secured through the union.

Mr. O'Connell makes a mistake all labor leaders make in respect to the "right" of a union to compel a mechanic who shares the improved conditions it has secured to contribute to the support of the union. The State is the only institution that has the right to compel individuals enjoying its protection and the other benefits it confers to share the expenses it incurs. No citizens' club, no church, no fraternal society, no political party, no labor union has a right to usurp the function of the Government and require a contribution to its work, no matter how many benefits it may have bestowed upon a citizen outside of its membership. President Mitchell urged with due vehemence before the Anthracite Coal Strike Commission the claim of the Miners' Union that no man should be allowed to work under conditions secured by the toll and contributions of the Miners' Union unless he chose to become a member of the union. He inveighed against all such as "enemies of their kind" and as aiding to defeat the "highest aspirations of labor"—an opinion which Mr. Mitchell has a perfect right to hold. Yet his right to maintain it is not one whit greater than the right of the nonunion workman to sell his labor to whom and on what terms he pleases.

We cannot see that the position of the labor unions in the "closed shop" has been misrepresented. President O'Connell's statement above is substantially as damaging as the average arraignment made by employers' organizations. The Machinists' Union naturally does not object to the right of any mechanic to "seek" employment, but it does seriously object to his getting employment if he be not of its fold. Apologists for the union position on this question may turn their statement in whatever plausible form they will, it comes out always to the same ultimatum—"no card, no work."

Little as union leaders recognize it, the road to their largest influence lies through the open shop. All that they gain through coercing men into their ranks will be but a temporary advantage. They will never be able to claim that "the best mechanics, the most intelligent workmen and the most industrious citizens can only be secured through the union" until they make the union standard of thrift, ability and law-upholding such as the best men in their crafts are accustomed to maintain. The Brotherhood of Locomotive Engineers has probably a better

basis for the claim President O'Connell would like to make than any union in the country, but it does not make the mistake of seeking the artificial bolstering of the "closed shop."

## British Iron and Steel Exports.

While our Canadian correspondence a week ago noted the recent placing of contracts in the United Kingdom for 23,000 tons of rails and an inquiry for 30,000 tons, all for Canadian roads, the British statistics for the first eight months of this year show that rail exports to Canada have so far been comparatively small—18,815 tons. It is to be noted further that the figure shows a great decrease from the first eight months of 1904, when British rail exports to Canada were 30,579 tons. It would appear, therefore, that the mother country has suffered more from the imposition of the Canadian rail tariff and from the bounty paid to Canadian steel works than it has been benefited by the fact that the tariff against British rails is considerably less than against rails from other countries.

British exports of iron and steel show in general a very noteworthy increase, comparing the periods just mentioned, the tonnage figures being as follows:

*British Exports, First Eight Months.*

|                                       | 1904.       | 1905.       |
|---------------------------------------|-------------|-------------|
|                                       | Gross tons. | Gross tons. |
| Scrap .....                           | 105,260     | 100,058     |
| Pig iron.....                         | 554,862     | 647,306     |
| Wrought iron bars.....                | 76,479      | 89,765      |
| Rails .....                           | 346,661     | 369,496     |
| Chairs and sleepers.....              | 34,166      | 50,421      |
| Miscellaneous railroad.....           | 49,008      | 47,078      |
| Galvanized and corrugated sheets..... | 250,885     | 261,700     |
| Black plates for tinning.....         | 42,488      | 42,362      |
| Tin plates.....                       | 229,725     | 247,189     |
| Steel bars.....                       | 76,440      | 96,636      |
| Other classes.....                    | 481,877     | 571,199     |
| Totals.....                           | 2,247,860   | 2,523,210   |

Nearly all the increase shown above in pig iron can be accounted for in the increase shown in exports to the United States, which advanced from 37,018 tons to 120,509 tons. Outside of the usual tin plate trade there were no other exports of much importance to the United States.

## The Smoke Nuisance in the Atlantic Cities.

Anthracite coal is no longer the exclusive fuel of the middle Atlantic seaboard cities. Time was, and at no distant period at that, when the only bituminous coal burned in such localities was in an occasional locomotive or in blacksmiths' forges. In recent years its use has extended to manufacturing establishments of many kinds, and despite ordinances against smoke there is now no city along the seaboard in which it is not found in offensively visible plumes around numerous chimney tops. The lower cost of bituminous coal first induced its substitution for anthracite by a few large consumers, who took the chance of an encounter with the authorities for the sake of effecting a saving in fuel bills. So strong has general sentiment been against adding sooty fumes to nuisances which cannot be avoided that such consumers would still have been few but for the anthracite coal miners' strike of 1902. It was then necessary to turn to bituminous coal for a considerable period and antismoke ordinances were not enforced. But despite resumption of mining and with an abundant supply of anthracite coal available many who for the first time had practical experience with bituminous coal continued its use. Even in the heart of New York City, with its traditional repugnance to smoke and soot, chimneys within a few blocks of the City Hall are now emitting clouds of bituminous coal smoke all day long. The sky

line, which was once sharply visible in any direction, is becoming obscured, and apparently the day is not far distant when clouds of smoke will hover over the city as they have always done over cities in bituminous coal districts. It only remains for the large office buildings and business structures to operate their power plants with bituminous coal to bring about this state of affairs. When it comes New York will probably be more grimy than the Western cities, for its furnaces and chimneys are designed for the use of anthracite coal. The combustion of bituminous coal will be far more imperfect under these circumstances and the sooty discharge from chimney tops will be vastly greater. If the authorities are not disposed to enforce the antismoke law, but continue to wink at its violation, they should at least endeavor to compel those who are turning to the use of bituminous coal to equip their furnaces properly for its use. A strong effort is being made by engineers to educate the public to use bituminous coal so as to secure a maximum of combustion and therefore a minimum of smoke and soot. Their efforts should be assisted by the authorities in this early stage of bituminous coal consumption. Otherwise, if the use of such fuel is permitted to grow rapidly, the day will soon be at hand when the problem of controlling smoke in the seaboard cities will be too great to handle.

### The Heat of the Sun.

The earth receives less than the one-two billionth part of the heat radiated by the sun. Although the sun must be losing a tremendous amount of energy all the time, there is no historical evidence that it is any cooler now than it was 2000 years ago. It must have some source of heat other than that due simply to incandescence, since in the latter case it would have lost to an appreciable extent during times of which we have record. The astronomer, R. S. Ball, says that it would take 20 tons of coal burned every 24 hours on every square foot of the sun's surface to maintain its heat. How, then, is the action of this great furnace to be explained? Meteors falling upon the sun will not answer the question, because the quantity is insufficient.

The nebular theory advanced by Laplace goes far toward solving the problem. Every heated body contracts when cooling, and in the contraction generates heat. Therefore, while the sun is constantly losing heat by radiation, it is gaining heat by the reduction of its bulk. By this double action the rate of cooling is reduced.

But we now have an entirely new theory evolved by a scientist whose work commands most serious attention—George Howard Darwin, Professor of Astronomy and Experimental Philosophy at Cambridge University. A few days ago he delivered an address at Johannesburg, South Africa, before the British Association, on "Celestial Evolution." Calculations based upon the constituent elements of the sun, as revealed by the spectroscope and their action, had led physicists to believe the age of the solar system to be less than 20,000,000 years; geologists have made the period between 50,000,000 and 1,000,000,000 years. Professor Darwin made the statement that recent researches in physics had shown that the heat of the sun might be produced by other causes than the simple concentration of matter. Radium is vastly more powerful than dynamite and 22 ounces of it would be sufficient to propel a 12,000-ton ship twice across the Atlantic at the rate of 15 knots per hour. The sun is radioactive and its tremendous energy may be explained by the new discoveries. At any rate, our knowledge of these

substances and of their action, while in no way conflicting with accepted theories, enables us to bridge important gaps. The study of the action of radio-active elements is of but recent origin. Should future examination bear out the conclusions so far reached, the life of the sun, past and to come, will be vastly extended, and we may surely expect the manifestation of its energy for periods of time beyond our comprehension.

### Foundries Becoming Better Employed.

While the foundrymen of the country have been increasingly busy in the last few months, it is now nearly two years since the foundry capacity of the United States was as fully occupied as at the present time. Malleable and steel foundries have been fairly prosperous through most of the present year, but the business of jobbing foundries has lagged. It has taken some time for the prosperity, which has been marked in the steel industry for months, to travel down the line to the manufacturer of castings, whose business depends largely upon the expansion of manufacturing in general. The building of new works, which was almost forgotten in the slack times of 1904, is now increasingly a factor. Boiler works, engine builders and manufacturers of electrical equipment have been finding larger inquiry recently than in many months, albeit for the last two classes of machinery competition has been keen all the year. The fact that heavy machinery castings have not advanced in proportion to various iron and steel rolled products has been commented upon; but the foundries have not yet reached the stage of prosperity at which the pressure for deliveries warrants prices yielding substantial profits. It is quite evident that the foundry capacity of the country has extended in recent years more than the capacity in certain lines of finished iron and steel.

### A Threatening Recommendation.

The recommendation of the president of the International Association of Machinists at the Boston convention that in the large industrial centers the unions bring together apprentices not eligible to membership in the machinists' body into an organization by themselves contains a menace that employers may very well consider with serious thought as to its possible results. In shops where efficient apprentice systems are established—and the number of such establishments is increasing and must increase even more rapidly during coming years—the apprentices are at present usually more under the influence of the shop management than that of the unions, even where unionism exists in material force. The unions realize this and would upset such a condition. The employers of apprentices can extend their influence with the young men. Where the union begins its campaign of education, as they would call it, the employers can meet them. The apprentice system is too important to be jeopardized, a fact which was never recognized more fully than at present, with the growing scarcity of well equipped mechanics.

W. S. Blatchley, Indiana State Geologist, in his annual report says that there are 11 refractory clay factories in the State and over 300 manufactories of brick and drain tile. The capital invested is \$3,272,000. About \$800,000 is invested in plants making pottery and allied goods and \$1,000,000 in dry pressed terra cotta and encaustic tile. Many plants are engaged in manufacturing sewer and conduit pipes and hollow vitrified blocks for building purposes. The clay industries of the State give employment to 7500 men.

## Scotch and English Iron Affairs.

### The Pig Iron Situation.

GLASGOW, September 15, 1905.—There is now in all the public stores of the United Kingdom a total stock of 630,350 tons, which is a gross increase of 412,000 tons since the end of December last. Of this stock 586,175 tons are Cleveland pig iron. Yet the price of Cleveland warrants has not receded with the increase of stock, but has advanced. There is no apparent increased foreign demand to account for this advance, and the stock is still growing, not diminishing. The advance is, in fact, due to the improved condition of our finished iron and steel trades and to the hopeful advices from America and Germany.

Although the bull clique does not now hold the warrants, which are well distributed, the iron has still to be disposed of. In all 1904 Cleveland No. 3 averaged only 43 shillings 11 pence and in 1903 46 shillings 4 pence. It is now 48 shillings 6 pence to 49 shillings, and the remarkable fact is that warrants are upheld, although there is no market at present in existence for 500,000 tons of Cleveland No. 3 iron over and above current make. The stock of Cleveland iron created by the manipulation of the May corner is now reserve iron. It has encouraged bears to sell warrants, but it has not discouraged bulls, who have faith in the prospects of trade, and it is comforting to those consumers who have been buying warrants pretty freely as protection against advances in makers' prices. And makers' prices have advanced.

It is not to be denied that the cornering of Cleveland iron has been to the advantage of Scotch. There is a full output of Scotch iron, which is going into consumption instead of (like Cleveland iron) into store. Smelters are getting good prices and have been able to advance rates 1 to 2 shillings per ton of late.

A notable feature is the run that has taken place on hematite or steel making pig iron. Cumberland hematite warrants have come into active demand and the price has rapidly advanced within the last week or so to 60 shillings 9 pence to 61 shillings. There is now only some 22,000 tons of this iron in the warrant stores, but makers have been selling warrants, so the quantity in store will be increased soon. Yet makers cannot have very much to spare considering the home demand of consumers, although the shipments are moderate. For this steel making iron there is an active demand here because the steel makers are all very busy, especially in connection with shipbuilding material. There was quite a number of ship contracts placed early in the year, which are keeping the shipyards well employed so far, but there has not been very much booking within the past three or four months, and as contracts are being worked off the present activity cannot continue beyond the autumn unless there is a revived demand for new shipping, of which there is some prospect.

### Labor Matters.

The shipyard workers in the Tyneside district have raised a claim for an advance of 1 shilling 6 pence per week, or 5 per cent., which after discussion the employers state they cannot grant at present. As the claim is not withdrawn it will doubtless go to a conference of the respective associations.

The only labor dispute here of any industrial importance is that of the pattern makers, who came out of the engine shops and shipyards on strike five months ago to enforce a demand for an advance in wages of  $\frac{1}{2}$  penny an hour. The employers declined to give this advance in the state of the trade at the time, and because they had booked contracts on the existing scale of wages. The pattern makers alienated sympathy even in other trade unions by striking on very short notice and without making any attempt to seek a conference with the employers for a discussion of the situation. Of course if they could not enforce their claim within five months they are not likely to do it now. As a matter of fact, the Federated Employers have got over the difficulty, not only by arranging a pattern exchange among themselves

and by employing nonunion pattern makers, but also by importing patterns and even castings from the Continent.

### Advance in Plates.

The price of steel ship and boiler plates has been raised by the English and Scotch steel makers, and ship plates are now £5 17s. 6d. to £6 per ton. These are not high rates, but they would have been lower had there been no combination to put an end to the former competition between Scotland and England. This combination does not work without friction, and moreover the shipbuilders are projecting a combination of their own to make ship plates for themselves, so as to be independent of the steel makers, just as a year or two ago they started a bolt and rivet making concern to counteract a combination of bolt and rivet makers. Whether they will go in for ship plate making, however, is very doubtful, for there are many side issues to consider, and moreover a steel maker who manufactures many different kinds of material does not always get a profit on the plates he sells to shipbuilders. And then there are always possible supplies from America and from Germany to swamp the market.

B. T.

### An Experience with Industrial Bonuses.

A town in a favorable location for diversified manufacturing numbered among its business men many who had accumulated wealth from a branch of trade that had gradually faded with the exhaustion of the local supply of raw material. Animated by a desire to arrest the decay of the city and also imbued with the hope of restoring the prosperity which had so long existed, these business men decided to endeavor to attract more manufacturing interests to their locality. Naturally they resorted to the offering of bonuses of land and financial assistance. The terms offered were liberal and the town did exceedingly well in the course of the next few years.

Among the manufacturing establishments thus secured quite a number proved to be good ones, well managed, turning out products easily marketed over a wide area of the country and their location in the city was permanent. Nevertheless, some of the experiences in this direction were of an unsatisfactory character. In one instance the town suffered from the formation of a consolidation in a branch of industry, which took in a plant that had been secured through a bonus, but which had been operated for a sufficient length of time to complete its contract with the city. The plant in question was operated for a short time after its absorption by the consolidation and was then closed on account of circumstances which appeared to be temporary, but proved to be permanent. It has never since been operated, and the buildings, which for a long time stood unoccupied, were finally disposed of for their salvage. In another case a plant was secured which appeared to have a flattering future, but it was only operated until the company's contract with the city was completed and it was then moved elsewhere to secure another bonus. The public spirited capitalists of the city in some instances made investment in the stocks of the companies which were induced to locate in the city, and owing to bad management or trade vicissitudes the companies failed and losses were sustained. They also ran against some sharp practices which might be expected to develop under conditions of this kind. An instance of this occurred not long after a good manufacturing proposition had been secured. An application was made by parties for a bonus to an enterprise in a totally different line, but in this case experience had made the city committee wary, and after an investigation it was found that precisely the same people were interested. In this case the second attempt was not successful, as it appeared too plainly to be an effort to secure easy money.

The town has on the whole prospered by the subsidies which have been granted to those seeking industrial locations. The citizens have not been discouraged by any of the untoward circumstances which have developed. They are simply profiting by their experiences and understand what pitfalls to avoid.

## First Report of the German Steel Syndicate.

The annual meeting of the German Steel Syndicate (*Stahlerwerkverband Actiengesellschaft*) was held at Düsseldorf September 7, and a report was presented by the council on the operations of the Syndicate in the 13 months from March 1, 1904, to March 31, 1905. The main features of the report are given in Düsseldorf correspondence of the *London Iron and Coal Trades Review*. The following figures, which are in terms of raw steel, or ingot weights, represent the deliveries of semi-finished steel, railway material and shapes, and side by side are given the allotments in the various classes:

*Deliveries and Allotments for 13 Months Ending March 31, 1905.*

|                        | Metric tons. |             |
|------------------------|--------------|-------------|
|                        | Deliveries.  | Allotments. |
| Semifinished .....     | 1,775,079    | 1,614,692   |
| Railway material ..... | 1,541,929    | 1,825,803   |
| Shapes .....           | 1,677,326    | 1,558,158   |
| Totals .....           | 4,994,334    | 4,998,743   |

It will be seen that the output and deliveries of semifinished steel exceeded the allotment by nearly 10 per cent. and those of shapes by over 7½ per cent., whereas the deliveries of railway material were 15½ per cent. less than the apportionment. The aggregate was only 4409 tons less than the aggregate allotment in the 13 months for the A group of products, and the sales would doubtless have been higher if the miners' strike had not interfered. The total business in the 13 months comprised 1,609,735 tons booked before the Syndicate came into existence and 3,384,599 tons contracted for and delivered after its organization, considered in tons of raw steel. The distribution of the business as between domestic and export trade is shown in the following:

*Domestic and Export Business.—Metric Tons.*

|                        | Ante-Syndicate orders. |         | Syndicate orders. |         | Total sales. |
|------------------------|------------------------|---------|-------------------|---------|--------------|
|                        | Inland.                | Export. | Inland.           | Export. |              |
|                        |                        |         |                   |         |              |
| Semifinished .....     | 202,133                | 203,152 | 1,073,413         | 296,381 | 1,775,079    |
| Railway material ..... | 582,797                | 212,764 | 565,002           | 181,366 | 1,541,929    |
| Shapes .....           | 198,493                | 210,396 | 1,094,244         | 174,193 | 1,677,326    |
| Totals .....           | 983,423                | 626,312 | 2,732,659         | 651,940 | 4,994,334    |

The report points out that the inland market showed greater capacity for absorbing semifinished products under the Syndicate. In the four months preceding its formation the inland sales amounted to from 56 to 63 per cent. of the total business in semifinished steel, whereas in the 13 months the home consumption ranged from 67 to 77 per cent., the average being about 72 per cent. The sales of semifinished products (weighed as such) in the past three years, reckoned from the beginning of March to the end of February, are given as follows:

| Year.         | Inland consumption. | Exports. | Total.    |
|---------------|---------------------|----------|-----------|
|               | Tons.               | Tons.    | Tons.     |
| 1902-03 ..... | 737,621             | 723,016  | 1,460,637 |
| 1903-04 ..... | 844,629             | 605,069  | 1,449,698 |
| 1904-05 ..... | 1,018,277           | 393,626  | 1,411,903 |

The purchases of German consumers of partly finished steel considerably increased under the Syndicate, while deliveries of these products abroad, which reached about 40 per cent. in the recent period before the formation of the Syndicate, declined to an average of about 28 per cent. in the Syndicate year in question. A reduction in the export prices has not taken place since December, 1904.

### American Competition in Rails.

The report says that the inland business in railway material declined late in the summer of last year. The home demand for the State railways diminished as compared with the previous year, and it seems as if a further reduction will have to be reckoned with; in particular the sale of iron sleepers was prejudiced by the increasing employment of wooden sleepers. In the case of mine rails and rails for light railways the business was of a normal character, prices being still only slightly remunerative. During the whole of the year the demand for railway material in the international market was extraordinarily small, and the increased competition of the

American works caused prices to reach a very low level. The demand has, however, recently improved, and prices have correspondingly become better. Of the total deliveries of 1,541,929 tons of railway material the export market absorbed 25.56 per cent. and the inland trade 74.44 per cent., while the proportion for shapes was 22.93 and 77.07 per cent., respectively, of the total of 1,677,326 tons.

The situation of the foreign business in shapes improved at the beginning of 1905, although the upward movement in this direction has not continued. As to the regulation of the trade in shapes the Syndicate decided to obtain an influence in the merchant business, as sales of shapes are mainly effected through merchants. As a consequence a number of merchant associations have been formed, both at home and abroad, whereby it has been rendered possible, on the one hand, to prevent speculation in the interests of the intermediate trade, to remove unprofitable competition among the merchants themselves and to support them in the holding of large stocks; on the other hand, the Syndicate influenced prices in ordinary trade. By this means the Syndicate defends the interests of consumers and is also able to look after the maintenance of consumption. The duration of the merchant agreements has been fixed for the period during which the Syndicate agreement exists. In order to promote the foreign trade in A products the report states that representative associations were formed in other countries which undertake sales and communication with customers from a uniform point of view.

### Open Hearth Steel Works Still Outside.

The syndication of the B products (which include bars, rods, wire, plates, sheets, pipes and tubes), now only controlled from the point of allotment and not from that of prices, is regarded by the Syndicate as one of its most important objects. A preliminary condition for this lies in the association of the open hearth steel producers to the Syndicate in some form, as well as the conclusion of an understanding with the independent rolling mills. The negotiations undertaken with the open hearth steel works, the report says, have been without result, partly owing to the high allotments demanded and partly because the works withdrew from the negotiations. On the other hand, the Syndicate had more closely considered the suggestions made by a number of the independent rolling mills for the formation of a bar iron syndicate, and the negotiations on the subject are proceeding now. The report expresses the hope that notwithstanding the great difficulties in the way better market conditions may yet be secured in B products.

During the year the following works became associated with the Syndicate: The Kettowitz Gesellschaft für Bergbau und Huttenbetrieb, the Phoenix Company of Laar, the Saxon Cast Steel Works, Dohlen; the Ehrenfeld Rolling Mills, acquired by the firm of Thyssen & Co., and the Huldshinsky Iron Works of Gleiwitz. But the repeated negotiations with the Westphalian Steel Works have not led to any understanding. The accounts show a total income of £12,799,334, of which £12,727,637 represents the proceeds of the sale of 2,619,971 tons (finished weight), or 3,043,050 tons of raw steel. Thus the entire deliveries for the year have not been brought into the accounts. The income is balanced by the expenditure, which includes payments to the works for steel supplied, cost of carriage, discounts to consumers, working expenses totaling £63,225 and bad debts amounting to the insignificant sum of £693.

It was announced on behalf of the council that the trade in shapes, both in Germany and abroad, has satisfactorily developed this year and that a good autumn business is expected, prices remaining unchanged; that the demand for semifinished steel continues to be heavy and prices will be maintained on the present basis until the end of March, with export bounties as at present, and that the export trade in rails has improved and higher prices are being realized. The meeting decided to accept as new members the Bismarck Works, the Upper Silesian Iron Industry Company, the firm of A. Borsig, the Bethlen-Falva Works, A. Schonawa and the Hoffnungs Works of Ratibor-Hammer.

## The Lake Ore Trade.

### Ore Shipments Diminishing.

DULUTH, MINN., September 23, 1905.—Ore shipments for the month will show a marked falling off, which will increase as the season draws near its close. The Duluth, Missabe & Northern Railroad, which has been the heaviest shipper, is about 500,000 tons behind for the month, and the Duluth & Iron Range is almost as badly off. The Great Northern is also behind. Railroads running from the old ranges seem to be maintaining their business fairly well, though they have lost something by the cleaning up of many stock piles. Wet weather on the Mesaba and a succession of difficulties largely caused thereby have been the reasons for this decline.

### Heavy Requirements for Equipment.

The Oliver Iron Mining Company is recommending to the Governing Committee of the United States Steel Corporation the expenditure of considerably more than \$1,000,000 for additional equipment and betterment for the coming year. It is not supposed that authority to make purchases will be given for some weeks to come. The Oliver Company is extending its plan of carrying forward its own stripping work and will require a number of additional locomotives and steam shovels for the purpose. In the list of equipment are no less than 65 large standard gauge locomotives and from 25 to 30 powerful steam shovels. There will also be a great many stripping cars and similar equipment. Nearly all of this will be for the Mesaba range, and a large portion of both shovels and engines are for the Hibbing district. The Oliver Company's order for shovels, given about a year ago, was the largest that had ever been placed for any private concern, perhaps the largest for any work, but it will be far exceeded in present requirements. For the new western Mesaba district, where the mines of the former Canisteo Company are being opened and where the company is doing a large amount of exploratory work, about \$215,000 will be needed at once for mine buildings, shafts and power. The Duluth, Missabe & Northern Railroad is now being extended to this part of the range, and though the season has been very bad it is apparent that the work will be completed by the opening of navigation.

These probable purchases by the Oliver Company are distinct from any orders for cars, locomotives or tools that may be given by either of the roads controlled by the Steel Corporation in the Mesaba district. No schedule of their necessities for 1906 has been made out, and it is impossible to say what they will demand in the way of new equipment. Doubtless if the iron market remains as now it will be a larger item than that of the mining company.

### Railroad Building Under Difficulties.

In the construction of its new ore line to the western Mesaba the Duluth, Missabe & Northern Railroad has been greatly impeded by weather conditions, and some of the contractors, notably the Drake Stratton Company, have had a pretty serious time. In the first place men have been very hard to get and have been brought from places as distant as St. Louis. Then the frequent rains—the summer shows 7 inches more than usual and twice as much as a year ago—have made roads over which all supplies must be hauled very soft. The expedients of these contractors in getting to their work have been remarkable. They have walked 80-ton steam shovels through the forests for miles by laying down a short piece of track ahead of them on which the shovels have been pushed along up hill and down along the rough country roads. Supply teams have for months been pulling through mud to the hubs, and for some of the large camps supplies are first hauled and then rafted over lakes and down rivers to points where they must be hauled again. Notwithstanding all this the work is going along well.

### The State Loses Its Suit Regarding Leases.

In the case of the State of Minnesota against certain mineral leases, in which the real intention of the State was to secure the forfeiture to it of all mineral contracts

held under its laws, the courts have just made a decision and on all points unfavorably to the State. In closing his decision on the question of the constitutionality of State leases the Judge stated:

With a uniform practical construction by every department of the State government the State has invited capital and energy to explore and develop its so-called mineral lands, some of value and some worthless, and has received returns running into the hundreds of thousands. In reliance upon the validity of the law men have given their time and money in exploring and developing the State's lands, and this has resulted in benefit to the State. All this has been done in just as good faith as has characterized the purchase of the State agricultural lands for investment or for actual settlement.

A construction long accepted as the correct one and never questioned is more likely to be the correct one than a construction discovered after many years; and when large enterprises have been inaugurated upon the faith of an accepted construction such construction must have even greater weight. There should now be no serious question upon the construction of the Constitution. It should be construed not to prohibit the leasing of the State mineral lands in the manner authorized by the Legislature.

### Drilling on the Deerwood Range.

My statement last week that there were 30 drills working on the new Deerwood range seems to have been an error. It was based on the number then operating and the expectation that more would be taken in immediately, as told me by operators. But the new drills failed to materialize, and there are now but 19 or 20 in the district. These are as follows: On the south range, 4 by the Northern Pacific road, 2 by Adams and scattering drills by three others; on the north range, 5 by Crosby, 2 by Congdon and Hartley and scattering drills by three or four others. Mr. Crosby is about ready to pull out, being much discouraged at the continued poor results, the ore being too lean for mining. This is not only true in his case, but probably in that of most of the others, though some of them claim to have excellent ore. Mr. Crosby is to put down a few more holes and if he gets no better results will cease. He thinks, as do many others, that where conditions have been such as to make possible such enormous deposits of lean ores there must be somewhere in the district some point where the concentration of ore has progressed far enough to make this ore good in commercial quantities.

At Stambaugh, Menominee range, Corrigan, McKinney & Co. are to sink a deep shaft. They will have 160 feet of wet sand to penetrate before they reach ledge, and elaborate preparations are being made to undertake the work. Their shaft will be 9 x 20 feet outside timbers and will be thoroughly equipped. This firm is doing more and planning more for the future in the immediate district around Crystal Falls and Stambaugh than any other mining company.

D. E. W.

**Mining Engineers' Meeting in England.**—The council of the American Institute of Mining Engineers has accepted an invitation from the council of the Iron and Steel Institute to hold a joint meeting in England in the fall of 1906. The dates have not been fixed, but the meeting will be in August or September. The sessions will be in London, followed by excursions to works in the provinces. In the circular communicating the above the secretary of the American Institute of Mining Engineers announces that the ninetyeth meeting of the institute for the reading and discussion of papers will be held at Lehigh University, South Bethlehem, Pa., beginning Wednesday, February 21, 1906.

**Good Work of a Southern Blast Furnace.**—The No. 6 Ensley furnace of the Tennessee Coal, Iron & Railroad Company, which went in blast in April, has been making an excellent output recently, several records of over 400 gross tons in 24 hours being noted. The maximum, 426 tons, was reached September 22. The furnace is 85 x 21 feet and is operating on 40 per cent. ores.

Rebecca Furnace of the Kittanning Iron & Steel Mfg. Company, Kittanning, Pa., has been blown out for relining and repairs. The muck bar mill of this company is also idle at present.

## PERSONAL.

August Ziesing was elected president of the American Bridge Company by the Board of Directors on September 21, succeeding Alfred J. Major, resigned. The other officers were re-elected.

Charles E. Stafford was re-elected president and Frank Drizler secretary and treasurer at the annual meeting of the Tidewater Steel Company, held in Philadelphia, September 20.

W. J. Fairbairn has resigned his position as secretary of the Milwaukee Metal Trades Association to accept a position with the Bucyrus Company of South Milwaukee.

Charles C. McCutchen, general manager of the American Roller Bearing Company, South Framingham, Mass., has resigned to accept a similar position with the Premier Motor Mfg. Company, Indianapolis. Frederick B. Hill will assume the position of manager of the Roller Bearing Company in addition to his other duties, and Thomas E. Griffin, formerly of the Waltham Mfg. Company, Waltham, Mass., has accepted the position of manager of the sales department.

Guy R. Johnson, formerly connected with the South Chicago furnace plant of the Illinois Steel Company, Chicago, has secured an interest in the Red River Furnace Company, whose plant is located at Clarksville, Tenn., and he is now in charge in the capacity of managing director.

Bertram G. Parker has been elected secretary and treasurer of the Youngstown Foundry & Machine Company, Youngstown, Ohio. Percy Parrock has been elected assistant to W. J. Wallis, general manager.

F. W. Reed of Craven Brothers, engineers, Manchester, England, is making a tour of the United States.

The new directors of the National Car Wheel Company, the reorganization of which was noted in *The Iron Age* of September 14, are James D. Rhodes, C. V. Slocum and George P. Rhodes, Pittsburgh; J. C. Holt, secretary of the Superior Charcoal Iron Company, Grand Rapids, Mich.; C. A. Otis, Jr., and William F. Bonnell of Otis, Bonnell & Co., Cleveland; C. A. Maher of the original Maher Wheel & Foundry Company, Cleveland; W. T. Goodnow, Sayre, Pa., and C. T. Chapin, Rochester, N. Y., formerly president of the National Car Wheel Company. James D. Rhodes is the new president, C. A. Otis and William F. Bonnell vice-presidents, George P. Rhodes treasurer and C. A. Maher secretary.

Carl Wallmann, chief engineer, and Alfred Drischner of the famous firm of Thyssen & Co., Muelheim, Ruhr, Germany, are travelling in this country visiting the leading steel works.

A. E. Borle, vice-president of the Bethlehem Steel Corporation, sails for Europe this week.

Robert Bacon, who was recently appointed by President Roosevelt to be Assistant Secretary of State to succeed Francis B. Loomis, resigned on Tuesday from the Board of Directors of the United States Steel Corporation. George F. Baker, president of the First National Bank, New York, was elected in his place.

## Labor Notes.

Following the national convention in Boston the International Association of Machinists has been quite active in organizing in and about New York City, the effort being to regain the position the association lost in the strike of 1903. The International Association of Bridge and Structural Iron Workers has also set out to organize the shops of the building trades. The success of these movements involves some interesting possibilities.

Upon the recommendation of the Committee on Laws the delegates to the International Association of Machinists, in session in Faneuil Hall, Boston, on September 15, voted almost unanimously to increase the minimum

dues in all lodges, increase the per capita tax and also the apprentices' per capita tax. The change includes an increase from 75 cents to \$1 a month for members, an increase from 40 to 55 cents in the per capita tax, and the apprentices' per capita will be increased from 25 to 30 cents a month.

The reported receipts of the International Association of Machinists from December 1, 1904, to May 31, 1905, were \$161,950; expenditures, \$177,883; deficit, \$15,933. In the six months' period the amount paid out in strike benefits was \$97,529.

The wage differences between the machinists' union and the manufacturers at Youngstown, Ohio, have been settled, the machinists receiving an advance of 2½ per cent. Their demand was for an advance of 5 per cent., but this was compromised by an average advance of 2½ per cent. and a nine-hour day.

## OBITUARY.

HENRY HOWARD, president of the Pintsch Gas Company and the Armington & Sims Engine Company and a former Governor of Rhode Island, died at Harris, R. I., September 22, aged 79 years. He was born in Cranston, R. I., and after graduating from the academy at North Scituate studied law, was admitted to practice and continued in his profession for a few years. He then became identified with the Harris Mfg. Company, cotton manufacturers, and continued with that company until his death, being its president. He was elected Governor of Rhode Island in 1873 and was re-elected. In 1878 he was appointed a commissioner to the Paris Exposition. He held many other offices of political and business trust. He leaves a widow and three children.

CYRUS M. AVERY, president of the Avery Mfg. Company, Peoria, Ill., died at his home, Galesburg, Ill., September 15. For the past 35 years he had been engaged in the manufacture of agricultural implements and machinery. The first Avery implement, a cultivator, was designed by his brother, Robert M. Avery, while confined in Andersonville prison. In 1869 the deceased and his brother formed a partnership for the manufacture of the cultivator at Galesburg and thirteen years later the plant was removed to Peoria. Mr. Avery was born in Galesburg June 19, 1846, and was graduated from Knox College. His widow and three daughters survive him.

FRANK B. HOSKINS, former Mayor of Fond du Lac, Wis., and a native of New York, died suddenly from appendicitis September 19, aged 55 years. He had been prominent in manufacturing circles in Fond du Lac for many years. He was president of the Eastern Wisconsin Railway & Light Company, which operates the local street railway system and the interurban line between Fond du Lac and Oshkosh. He was also secretary of the Harrison Postal Bag & Rack Company, manufacturer of the iron racks used by the United States mail service in postal cars and in post offices. He was elected Mayor of Fond du Lac in 1898 and served for two terms.

JOHN F. BYERS, senior member of the John F. Byers Machine Company, Ravenna, Ohio, and inventor of the Byers hoist and contractors' locomotive, died on September 17, 1905, aged 62 years.

RICHARD A. HEALY, mechanical engineer and inventor, for a number of years at the head of the engineering department of the J. C. Todd Works, Paterson, N. J., died on September 26, aged 66 years. He was born in London and came to the United States 40 years ago. While connected with the Cooke Locomotive Works he invented a number of appliances for locomotives.

In one day recently the angle mill of the Carnegie Steel Company, at South Sharon works, South Sharon, Pa., turned out 579 gross tons of small angles, the largest day's record in the history of the plant. This mill turned out in August 11,000 tons of angles, which is certainly a very creditable record.

## NEWS OF THE WORKS.

## Iron and Steel.

The new blast furnace to be built at the South Works of the Illinois Steel Company, Chicago, will have a rated capacity of 450 tons daily and will be built adjacent to the group of four furnaces at the south end of this plant. This plant now comprises ten stacks, and when the eleventh is completed the iron producing capacity will be sufficient to provide for the increased steel capacity. The boiler house adjoining these four furnaces will be razed to provide room for the additional furnaces and the boiler plant will be rebuilt elsewhere. Additional blowing capacity will also be added, consisting of several blowing engines, and the boiler capacity will also be added to. The new open hearth plant to be built will be a duplicate of the plant completed early this year and will comprise seven furnaces of 50 tons capacity each. This increased steel capacity is to provide for the requirements of the structural mill now under erection, and when the additional seven furnaces are completed the steel capacity will be slightly greater than the finishing capacity of the mill. Foundations for these additions will be laid this fall.

The Rome Merchant Iron Mill, Rome, N. Y., manufacturer of high grade bar iron, has completed the rebuilding of its plant, which was almost entirely destroyed by fire February 7. It is now equipped with up to date machinery driven by electrical power, and is in a better position than ever to sustain its reputation as a maker of special stay bolt iron and other extra grades of bar iron. The plant is running full in all of its departments with a generous supply of orders.

The Firth-Stirling Steel Company, Pittsburgh, with works at Demmler, Pa., maker of crucible steel and projectiles, has leased the melting department of the plant of the Burns Uniform Steel Company, at Latrobe, Pa. The company will operate this melting department, turning out steel ingots, which will be sent from Latrobe to its plant at Demmler, to be finished into crucible steel and projectiles.

The Atikokan Iron Company, Limited, Port Arthur, Ont., has broken ground for the erection of a blast furnace at that place. The stack will be 75 feet high, will have a bosh diameter of 15 feet and will be equipped with three Roberts stoves. Iron ore will be shipped from the Atikokan range, which is located about 130 miles west of Port Arthur. A battery of coke ovens will be built near the furnace of sufficient capacity to meet the furnace requirements. The plant will have an annual capacity of about 6000 tons of foundry and Bessemer iron. The officers of the company are D. D. Mann, president; J. C. Hunter, vice-president and manager; Hugh Sutherland, treasurer, and Robert R. Jones, superintendent of furnaces.

The Columbus Structural Steel Company, Columbus, Ohio, in preparation for the starting of its plant, has authorized the purchase of \$25,000 worth of steel. It is not expected that the company will be turning out finished material until the first of the year.

The Alabama Steel & Wire Company is meeting with great success at its Ensley plant in the operation of machines for the manufacture of woven wire fencing. The company has more orders for this class of product than it can fill.

The furnace of the Penn Iron & Coal Company, Canal Dover, Ohio, has been blown out for relining.

The Virginia Iron, Coal & Coke Company will move its rolling mills from Max Meadows to Bristol, Va. The plant, which now has a capacity of 1000 tons a month, will upon its re-erection be increased in capacity about 50 per cent. It is estimated that it will cost about \$15,000 to move the plant.

The plant of the Union Rail Company, Huntington, W. Va., maker of light rails, which has been idle for some time, is expected to start up this week. A. F. Baumgarten, Farmers' Bank Building, Pittsburgh, will in future have charge of this plant.

We are officially advised that the report that the plate mill at the Valley works of the Republic Iron & Steel Company, Youngstown, Ohio, was to be dismantled is incorrect. No plans have been made for removing this plate mill, and while it has not been in operation for some little time it is expected that it will be started up before very long on account of the heavy demand for plates.

The Tidewater Steel Company, whose plant is at Chester, Pa., is stated to be negotiating with possible purchasers. The proposed lease by the Bethlehem Steel Corporation, reported some months since, was not consummated. The plant has been idle for a long time. It comprises a blast furnace, five basic open hearth steel furnaces, a 32-inch blooming mill, a 112-inch plate mill and a 72-inch plate mill.

The Lackawanna Steel Company, Buffalo, N. Y., blew out its No. 2 furnace, 300 tons capacity, for relining and general repairs on September 3. It will be out of blast about six weeks. The company's new No. 3 furnace, 600 tons capacity, was blown in on September 2.

The Harrisburg Rolling Mill Company has started a part of its puddle mill at Harrisburg, Pa. This department has been idle all summer.

## General Machinery.

The Larsen Ice Machine Company, Omaha, Neb., received contracts for the following installations: Ten-ton refrigerating plant, Marshall-Sanborn Creamery Company, Marshall, Minn.; 10-ton refrigerating machine, direct connected to engine, James M. Alexander, Aberdeen, Wash.; 20-ton refrigerating and freezing plant, Northern Grain Company, Cedar Rapids, Iowa; 15-ton ice machine, Provo Ice & Cold Storage Company, Provo, Utah; 10-ton refrigerating system, Morse & Andrews, Manchester, Minn.

W. A. Harrison, Lubec, Maine, has established a machine shop in a wing of the electric light station. He does not plan to do much business until next spring.

F. J. Nutting, designer and manufacturer of special machinery, tools and fixtures, Dayton, Ohio, is enlarging his plant and installing \$3000 worth of modern machine tools as a result of the heavy business which he is receiving. He reports one contract for \$17,000 and several others of good size.

The Great Lakes Engineering Company, Detroit, Mich., was awarded a contract by Brandon & Beal, Leavenworth, Kan., for all the machinery necessary for a 50-ton ice making plant.

The Tomlin-Harris Machine Company, Cordele, Ga., is enlarging its machine shop from 40 x 134 feet to 90 x 134 feet and will install an air compressor to operate its general line of tools.

The Dayton Pneumatic Tool Company, Dayton, Ohio, has received an order from the American Car & Foundry Company for 50 of its Green long stroke riveting hammers. This is one of the largest single orders ever placed for this class of machinery and is the result of a test made by the American Car & Foundry Company of all the various makes of pneumatic hammers. In this test it is reported that the Green 8-inch long stroke hammer drove  $\frac{3}{4}$ -inch rivets on an average of  $4\frac{1}{4}$  seconds. The tools on this order are to be all one size, having a piston diameter of  $1\frac{1}{8}$  x 8 inch stroke, and are for use in the new steel underframe department of the American Car & Foundry Company, at Madison, Ill.

The Central Iron Works, Quincy, Ill., recently booked an order for 400 cement block machines and accessories. This will rank as probably one of the largest orders ever placed for machines of this kind and indicates the increasing use of cement blocks for building purposes throughout the country.

The Baltimore & Ohio Railroad Company has awarded contracts for the extensive improvements to be made at South Baltimore, Md., at a cost of about \$500,000. The work will include the construction of a machine shop, power house, large coal tipple and two round houses.

The name of the Herron & Bury Mfg. Company, Erie, Pa., has been changed to the Bury Compressor Company and facilities have been increased for the manufacture of its air and gas compressors and vacuum pumps. The export, Southern and Western trade of the company is greatly increasing in volume. Several orders have been received from France and Belgium through Fenwick, Freres & Co. during the month of September, including one for the French Government. The company has a compressor on exhibit at the International Exhibition at Liège, Belgium, which is doubtless responsible for some of the sales in that section of the world.

The Toledo Machine & Tool Company, Toledo, Ohio, manufacturer of presses, dies, punches, shears and other sheet metal tools, advises us that it has prospects of doing a largely increased business in its products in Japan. The concern is receiving inquiries and furnishing sheet metal working machinery to the Japanese Government and to private Japanese concerns. It is also doing a large export business in Germany and has recently made quite large shipments to Denmark.

## Power Plant Equipment.

Citizens of Waukesha, Wis., are making an effort to secure for their city the plant of the Mechanical Appliance Company, of Milwaukee, manufacturer of electric motors and dynamos. The plant at present is in rented quarters.

Port Washington, Wis., will erect a municipal lighting plant and water works, a special election taken September 19 having been favorable to municipal ownership. The water will be taken from Lake Michigan and work commenced on the plant at once.

The Rodgers Boiler & Burner Company, Muskegon, Mich., has in course of construction a manufacturing building 50 x 150 feet. A boiler house 18 x 25 feet is also being erected for temporary service, as the plant will later be operated by electrical power furnished by the Grand Rapids-Muskegon Water Power Electric Company, which is now building three large dams on the Muskegon River. The plant will be equipped with modern boiler makers' tools, including bending rolls, splitters, bevel shears, punches and air compressors. Members of the company are Edward Behrens, L. Rodgers and Richard Pyle.

Machinery is now being placed in the new plant of the Broderick & Quinlan Mfg. Company at Muncie, Ind. It will be remembered that this boiler plant is being removed from Montpelier, Ind. The equipment includes one electric crane of 20 tons capacity and several others of 5 tons capacity. In addition to the structures which will house the plant a two-story office building is to be erected.

That the mechanical stoker has reached such a state of perfection as to be considered indispensable in the equipment of modern boiler plants is indicated by the large number of orders booked by the Westinghouse Machine Company for its Roney stoker. During the past ten years this company has developed the Roney stoker by successive improvements until it has become capable of meeting successfully all the requirements of heavy modern service. During the past month orders have been received for no less than 51 Roney mechanical stokers, ranging in size from 20 x 54 inch grate to 26 x 132 inch grate, the largest of the orders being that of the Pennsylvania Railroad for six 26 x 132 inch grate stokers and five 20 x 100 inch grate stokers. A large order from the Ohio Hospital for Epileptics at Gallipolis, Ohio, has also been received and others from the American Bridge Company, Ambridge, Pa.; National Tube Company, Pittsburgh, Pa.; Detroit United Railway Company, Detroit, Mich.; York Engineering Company, York, Pa.; Proctor & Gamble Company, Cincinnati, Ohio; Union Rolling Company, Cleveland, Ohio; Gulfport & Mississippi Coast Traction Company, Gulfport, Miss.; United Presbyterian Board of Publication, Pittsburgh, Pa.; Indiana Boys' School, Plainfield, Ind.; Baltimore & Ohio office building at New York, and the Railway Exchange Building at Chicago, Ill.

The New York Edison Company has bought a tract of land in New York, bounded by Academy street, 201st street and the Harlem River, which includes 30 lots and will probably eventually be used as a site for a power plant, but the company will not build on it for some time to come.

#### Fires.

The American Woolen Company's picker mill, Collinsville, Mass., was destroyed by fire September 16, with a loss of \$50,000.

#### Foundries.

The Griffin Wheel Company, Chicago, is building two one-story additions to its foundries at Forty-third and Wood streets. One addition is 64 x 87 feet, costing \$8000, and the other 55 x 200 feet, costing \$15,000.

The Brass Foundry business of Wm. B. Anderson, Chicago, has been incorporated under the style of Wm. B. Anderson & Co. A specialty is made of castings in copper and acid metals.

The Perfection Grate Company, Springfield, Mass., has been incorporated under Massachusetts laws, with capital stock of \$3000, to manufacture shaking, chopping and dumping grates for both high and low pressure boilers. Manufacturing has already begun. The officers are: President, Theodore F. Handy; secretary and treasurer, Grace E. Spooner; general manager, F. W. Riddlon; directors, Nelson J. Hibbard, Grace E. Spooner, T. F. Handy and Henry E. Corey.

James D. Rhodes and others, who recently secured control of the National Car Wheel Company, are moving the general offices from New York to Pittsburgh. It is the intention to enlarge some of the plants, especially the Pittsburgh plant, as soon as possible.

The new plant which the recently organized Bucyrus Steel Casting Company, Bucyrus, Ohio, will erect will be 130 x 300 feet, constructed entirely of steel. The contract for the building will be let within the course of the month. The company will manufacture open hearth steel castings. P. J. Carroll is president and general manager; F. P. Donnerwirth, vice-president, and W. A. Blicke, secretary and treasurer.

The Syracuse Aluminum & Bronze Company has been organized to manufacture high grade aluminum and bronze castings and has taken over the plant of the Stearns Steam Carriage Company, at Syracuse, N. Y., which has been remodeled into a thoroughly modern foundry. The company will make a specialty of automobile, marine and engine work.

#### Bridges and Buildings.

W. B. Tharrington, County Clerk, Cordell, Okla., will receive bids until October 2 on a 100-foot steel bridge.

The H. A. Petersen Mfg. Company, Chicago, which operates plants at Harvey and Lake View, Ill., for the manufacture of structural, ornamental and architectural iron work and electric conduits, is increasing the capacity of its Harvey plant by the erection of a one and two story factory, 75 x 150 feet, which will be electrically equipped.

M. E. Trapp, County Clerk, Guthrie, Okla., will receive bids until October 2 for all material for the superstructure of 16 steel bridges.

The San Antonio Structural Steel Company, San Antonio, Texas, has been awarded a contract for a \$30,000 jail to be erected at Stephenville, Erath County, Texas. The steel part of the jail will be built entirely at the San Antonio plant. A rolling mill has recently been started at Fort Worth and it will furnish a great part of the material.

The Flour City Ornamental Iron Works, Minneapolis, Minn., is to enlarge its main building to 75 x 300 feet, two stories. The building, together with new power plant, new additional machinery and improvements, represents an expenditure of \$17,500 and will be completed October 1.

#### Hardware.

The Monarch Metallic Fence Company, Crawfordsville, Ind., has filed articles of incorporation and will manufacture a com-

bination iron and cement post patented by Dr. Joseph Utter of that city. The company is incorporated for \$30,000, and its first Board of Directors consists of George B. Luckett, Basil T. Merrell, Frank C. Evans, Joseph Utter, Clarence W. Stroh, Jesse W. Canine and Wm. M. White. A factory will be erected at once.

The Plymouth Cordage Company, North Plymouth, Mass., will establish a large branch plant at Welland, Ont., to take care of the company's Canadian business.

The Leavitt Mfg. Company, Urbana, Ill., has incorporated with a capital of \$30,000 and will manufacture corn huskers, lawn mowers, dehorers and other small implements. Those interested in the company are: H. W. Leavitt, president; J. W. Nooman and Eugene Christopher.

John Durkee and W. F. Richards of Woodbine, Iowa, are organizing a company for the manufacture of the Durkee patent hard center horseshoe calks. An office has been opened in the Everett Block, Council Bluffs, Iowa, and as most of the stock has already been subscribed it is expected to have a factory in operation at Woodbine in a very short time. Machinery for the making of the calk will be made from designs of Mr. Durkee.

The Florence Exhibitor System, a New York corporation with a capital stock of \$100,000, has established a factory in the plant of the Hartford Woven Wire Mattress Company, Capitol avenue, Hartford, Conn. The Exhibitor System is designed for displaying goods in store windows and other places. De Witt Bergen is president of the company; Edward J. Manning, general manager of the Underwood Typewriter Company, is the treasurer; Horace G. Teele, secretary, and George H. Allen, manager.

The Atwood Mfg. Company, Amesbury, Mass., has been incorporated in Massachusetts with a capital stock of \$40,000 and will manufacture coach, automobile and carriage lamps. The company is now moving into the five-story building formerly occupied by N. H. Folger and will have ample facilities for taking care of a growing business. The officers are: President and treasurer, W. J. Atwood; vice-president, I. H. Atwood; directors, Messrs. Atwood and James H. Hume.

Norton Emery Wheel Company, Worcester, Mass., among other additions and improvements has erected new kilns and added about 50 per cent. to the floor space of its wheel plant. The power house has been extended and new boilers, pumps, &c., installed. The capacity of the crushing plant has also been increased, while the machine shop of the Norton Grinding Company has been doubled in size. A considerable addition to the office buildings has also been made.

McCaffrey File Company, Philadelphia, Pa., has completed a new addition to its factory so as to meet the enlarging demand for its files and rasps.

The Alma Mfg. Company, 611-651 South Monroe street, Baltimore, Md., has increased its capital stock to \$500,000, fully paid up. The original plant has also been enlarged to provide for the company's increased business. The company manufactures buttons, buckles, fasteners and novelties.

The Standard Scale & Supply Company, Pittsburgh, has secured the annual contract of the Pere Marquette Railroad for its requirements in the way of scales for the year ending August, 1906, also a contract for installing a 150-ton track scale for the Richmond, Potomac & Fredericksburg Railroad, at Richmond, Va. The company is also receiving large orders for scales for shipment to Mexico, South America and other foreign countries.

The Wagner Mfg. Company, Sidney, Ohio, manufacturer of finished hollow ware and aluminum ware, is adding two new buildings to its plant. With these additions the floor space will be increased to 70,000 square feet. In July, 1891, the company commenced operations with 20 employees. Since that time its constantly growing business has required four additions to the original factory. At the present time about 200 persons are employed.

#### Miscellaneous.

The Wistrand Mfg. Company, Galva, Ill., is making improvements to its plant which include a new building, 61 x 76 feet, with an ell 38 x 58 feet and a boiler room 12½ x 32 feet. A cupola and grind room have been completed. The company manufactures planters and pumps and also a line of display racks for J. H. Best.

The H. O. Canfield Company, Bridgeport, Conn., manufacturer of mechanical rubber novelties, is to remove its business to the plant on Housatonic avenue recently occupied by the Bridgeport Hardware Mfg. Company. A one-story addition, 50 x 90 feet, is being erected and the lease will begin when this is completed.

The Ajax Electric Mfg. Company, Boston, has been incorporated in Massachusetts, with a capital stock of \$5000, to manufacture electric goods and will make specialties of electric fixtures and electric air pumps. For the present the office and shop will be located at 96 Essex street, Boston. The officers are: President, Charles C. Walker; treasurer, Fred. E. Smith; clerk, L. K. Storrs, the three constituting the Board of Directors.

The A. O. Smith Company, Milwaukee, Wis., manufacturer of automobile frames and parts, has increased its capital stock to \$250,000.

## Trade Publications.

**Gear Patterns and Power Transmitting Machinery.**—Townsend Furnace & Machine Shop Company, Albany, N. Y. Catalogue. Size,  $4\frac{1}{2} \times 7\frac{1}{4}$  inches; pages, 170. Eighth revised edition, superseding all previous issues. This firm is engaged in the making of machinery and machinery castings of all kinds, specialties being gearing, shafting, pulleys, hangers, &c. This catalogue is mainly devoted to a list of standard gear patterns, in spur wheels, bevel wheels, miter wheels, worm wheels and worms and racks. Valuable tables of reference, rules and data for calculating sizes, speeds, &c., of gears and pulleys and considerable general information is included. Appended is a partial list of articles manufactured by this concern.

**Packings.**—Crandall Packing Company, Palmyra, N. Y. Catalogue and price-list. Size,  $5\frac{1}{2} \times 8\frac{1}{4}$  inches; pages, 70. Covers steam, ammonia, gas, air and hot or cold water packings. Illustrations and explanations of the service for which each type of packing is intended are given. Among them are reinforced sectional ring packing, Helios high pressure ring and spiral packing, expansion ring and spiral packing, octagon and steam hammer ring packing, water proof hydraulic ring, coil and spiral packing; Triumph packing, special flat marine packing, high duty elevator packing, special hot water ring packing, red core piston and valve rod ring packing, flat Helios gaskets, wire woven; red tubular gaskets, flax packing, red sheet packing, &c. Prices are given of each style.

**Alternating Current Motors.**—Wagner Electric Mfg. Company, St. Louis, Mo. Folding mailing card. Contains half-tones of type BA, standard single phase constant speed motor; type BS, standard single phase elevator hoist and variable speed motor; type BM, standard "squirrel cage" polyphase motor, and type BR, standard "external resistance" polyphase motor.

**Pumps and Pumping Engines.**—American Steam Pump Company, Battle Creek, Mich. Two catalogues, each  $6\frac{1}{2} \times 7\frac{1}{4}$  inches in size. Catalogue No. 12, section 4, illustrates the Marsh deep well pumping engines. Tables of sizes and capacities are given for each type. Other tables give dimensions of pump cylinders fitted with bronze ball valves or metallic valves. Brief reference is made to the elevating of water by the air lift system with Marsh compressors. The other catalogue deals with Marsh boiler feed pumps, describing their advantages and showing engravings of the different types, with each of which tables of sizes are given and in several cases sectional elevations. Specialties described and illustrated are the Marsh patent live steam actuating and governing valve, yacht pumps, outside packed plunger pumps, high service piston pumps and the Marsh marine pumps. Two accompanying pamphlets deal with American power pumps and air compressors and the Marsh boiler feed pumps, each containing brief descriptions and tables of specifications.

**Locomotive Cranes.**—Browning Engineering Company, Cleveland, Ohio. Bulletin No. 19. Shows half-tones of Browning locomotive cranes at work in a variety of services, in stone yards, railroad yards, structural yards, lumber yards and storage yards, handling castings, stone, lumber, coal, ashes, logs, cars, pushing and pulling cars, &c.

**Paper Machinery.**—Mills Machine Company, Lawrence, Mass. Illustrated catalogue. Size,  $5 \times 9$  inches; pages, 27. Deals with paper mill, board mill and pulp mill machinery, including renewable bed plates, Holland beating engines and washing engines, patented construction roll, new shape fly bars, wet machines, stock pump, Jordan engines and Mellor's patent eveners and knot breaker.

**Air Lift Pumping.**—Ingersoll-Sergeant Drill Company, 26 Cortlandt street, New York. Leaflet. Gives a brief discussion of air lift pumping, several methods of piping, costs, advantages and field of application.

**Transmission Chains.**—Link-Belt Engineering Company, Nicetown, Philadelphia, Pa. Booklet No. 54. Illustrated. Subject, "Renold Roller Chain." Calls attention to the many uses of high grade machine made steel roller chain. Contains a brief description of Renold bush roller chain, notes on choosing and laying out a chain gear, care and lubrication, price-list and method of shortening or lengthening the chain.

**Valves.**—Schutte & Koerting, Twelfth and Chestnut streets, Philadelphia, Pa. Three circulars. One shows an extra heavy flanged iron body automatic stop check valve for pressures up to 250 pounds, the manner of installing, and gives a price-list. Another refers to a quick closing balanced trip valve with a single seat for pressures up to 250 pounds and a combined throttle and quick closing balanced trip valve. The third circular contains a reprint from an article in the *Electrical Review* describing the power plant of the Chattanooga Electric Company, Chattanooga, Tenn., referring particularly to the pipe lines and nozzles in the condensing equipment.

**Contracting.**—Miller-Collins Company, 1133 Broadway, New York City. Pamphlet. Contains a number of illustrations of buildings and shops erected by this firm, whose specialties are concrete, steel and masonry construction. Also contains an outline of the methods and facilities of this company.

**Steam Specialties.**—Warren Webster & Co., Camden, N. J. Folder. Deals briefly with a number of the company's

products, including feed water heaters, feed water heaters and chemical purifiers, separators for steam and oil, expansion joints, preference valves, Webster system of steam circulation for heating, automatic water and air relief valves, vacuum governors, sight glasses, thermostatic traps, atmospheric check valves, dirt strainers, receiving and storage tanks and suction strainers.

**Electrical Machinery.**—Westinghouse Electric & Mfg. Company, Pittsburgh, Pa. Catalogue. Prepared particularly for distribution at the Lewis and Clark Exposition, Portland, Ore. Gives an account of the works of the company, lists a few of the many products and calls attention to the apparatus displayed in the company's exhibit at this Exposition. Folder No. 4047 deals with the new Westinghouse integrating watt-meter, type B. This is designed for single phase two and three wire circuits for 7200 and 16,000 alternations.

**Power Transmitting Appliances.**—T. B. Wood's Sons, Chambersburg, Pa. Pamphlet. Contains illustrations, with very brief descriptions of a few of the articles manufactured, including shafting, couplings, collars, pulleys, hangers and all parts pertaining to power transmitting machinery.

**Street Railway Construction.**—J. G. White & Co., 43 Exchange place, New York City. Catalogue. Size,  $8 \times 10\frac{1}{2}$  inches; pages, 15. Subject: "Interurban Railway Construction." Illustrated with several interesting half-tone reproductions of various pieces of work executed by this company, including power houses, their equipment, underground conduit construction, car barns, line construction, car bridges, &c. Describes the organization and scope of the J. G. White Company and the three associated companies—J. G. White & Co., Limited, London, England; Waring-White Company, Limited, London, and the Canadian White Company, Limited, Montreal.

**Electric Generators.**—Crocker-Wheeler Company, Amper, N. J. Bulletin No. 55. Describes the general construction and gives the sizes of small generators arranged for direct connection to steam or gas engines.

**Ship Equipment.**—Horace See, 1 Broadway, New York. An album of illustrations of vessels, interspersed with advertisements of manufacturers of equipment, such as boilers, bearings, engines, yacht fittings, feed water heaters, pumps, turbines, &c.

**Pneumatic Hammers.**—Ingersoll-Sergeant Drill Company, 26 Cortlandt street, New York City. Publication form No. 6. Describes, illustrates and lists a full line of Haeseler axial valve hammers. Calls special attention to dimensions, construction and operation of the valve arrangement. Illustrations show the hammer in use, and others on the back cover show different types of air compressors suitable for supplying pneumatic tools.

**Crushing Machinery.**—Good Roads Machinery Company, Kennett Square, Pa. Two catalogues. First is entirely composed of illustrations, with brief explanatory captions, showing Champion crushing plants now in use. They range in size from 75 to 300 tons daily capacity and are of sufficient variety and design to indicate how such plants may be erected under different conditions and circumstances. The other is the twenty-eighth annual catalogue of Champion road and street working machinery, contractors' tools and supplies, and covers the following: Road graders, road rollers, rock crushers, elevators, conveyors, screens, bins, engines and boilers, dump cars, stone spreading carts, dump carts, winding drums, hoisting engines, wheel scrapers, drag scrapers, road plows, rock drills, street sweepers, street sprinklers, culvert pipe, sewer pipe, saw mills, contractors' tools and supplies.

## New York Pig Iron Warrant Market.

The trading in pig iron warrant certificates in the Produce Exchange during the week ending at noon on Wednesday aggregated sales of 800 tons. The transactions were as follows: 100 tons, September regular, \$15.40; 100 tons, October regular, \$15.35; 500 tons, November foundry, \$15.75; 100 tons, January foundry, \$15.80. The prices established on call Wednesday noon were materially higher than those of the previous week:

|                 | Regular. |         | Foundry. |         |
|-----------------|----------|---------|----------|---------|
|                 | Bid.     | Asked.  | Bid.     | Asked.  |
| Cash .....      | \$15.30  | \$16.00 | .....    | .....   |
| September ..... | 15.30    | 16.00   | .....    | .....   |
| October .....   | 15.35    | 16.00   | \$15.50  | \$16.00 |
| November .....  | 15.50    | 16.00   | 15.60    | 16.00   |
| December .....  | 15.55    | 16.00   | 15.60    | 16.00   |
| January .....   | 15.60    | 16.25   | 15.65    | 16.10   |
| February .....  | 15.60    | .....   | 15.75    | 16.10   |
| March .....     | 15.60    | .....   | .....    | .....   |

**Additions to Homestead Open Hearth Plant.**—At the Homestead works of the Carnegie Steel Company ten furnaces are to be added in the open hearth department, their product eventually displacing that of the Bessemer converters at this plant. The demand for open hearth steel in structural lines has steadily grown and the tonnage of Bessemer steel in these lines has declined.

## The Iron and Metal Trades

The past week has carried further the remarkable buying movement that burst upon the Iron market two weeks ago, and the September tonnage is easily the greatest for a single month in the history of the trade. While there are evidences of excitement here and there, business for the most part has been done in an orderly way, and veterans in the trade refer to the present market as the greatest in which they have participated.

The United States Steel Corporation has bought 40,000 tons of Bessemer Iron at \$15 at furnace for delivery in September and October. Further Iron will be required for October and the corporation is expected to be a buyer of Bessemer at the rate of 40,000 tons a month well into next year. The total of its purchases in September is 80,000 tons. Bessemer Iron is now squarely \$15.50 at Valley furnace. In the Foundry Iron trade a prodigious business has been rounded up and leading Southern sellers have booked a record tonnage in September. The largest seller is reported to have taken orders for 100,000 tons last week. Northern sellers have been exceedingly busy also, particularly in the East and the Central West. The movement has given strong proof that foundries are at last getting a fair share in the general prosperity.

Three Alabama sellers of Foundry Iron are out of the market temporarily, but inquiries of large aggregate for the first quarter and first half of 1906 are pending and \$12.50 for No. 2 Foundry Iron at Birmingham is now quoted. Eastern Pennsylvania furnaces now have their prices 50c. to \$1 a ton above those of two weeks ago. In the Central West the minimum has advanced from \$14.50 to \$15 at furnace for No. 2 Foundry.

Eastern buyers of Basic Iron have taken 60,000 tons additional and the market is very firm at \$16, delivered.

Coke manufacturers have advanced prices and are chary of long commitments. Contracts for Connellsville Furnace Coke have been made at \$2.50 for the first half of 1906 and other contracts at \$2.60 are pending. The possibilities of an Anthracite strike and the pinch of car shortage are both influential factors in the Coke situation, which is particularly strong.

Lake Superior Ore interests are already discussing higher prices for next year and sales are expected before the close of 1905.

Sales of English Hematite for Atlantic Coast delivery in this country have been erroneously reported. In early September 30,000 tons were arranged for in addition to the purchases of last spring, and it is understood that a deal for 30,000 tons additional is pending, deliveries extending into next year. Prices on the other side have advanced to 58 shillings for East Coast Hematite. Quite heavy buying of foreign Spiegeleisen and Ferromanganese for Pennsylvania Steel makers is reported, 30,000 to 40,000 tons being taken in the past week. Ferro has advanced \$4 to \$5 a ton in the past fortnight.

Rail buying and railroad equipment demand are still the backbone of Finished Material markets. Fully 125,000 tons of Rails have been booked in the week, including 10,000 tons for the Central of Georgia, 8000 tons for the Des Moines & Fort Dodge, 30,000 tons for the Northern Pacific, 40,000 tons for Rock Island, 10,000 tons for Central of New Jersey and 25,000 tons, in addition to the earlier order, for Norfolk & Western. More Rails than ever for the Southwest and Northwest will be rolled in Pennsylvania next year, the Chicago mill being filled up to November 1, 1906.

The stringency in Structural Material is more marked and Chicago jobbers are now shipping far afield, reaching both coasts. Plate mills are a close second to Shape mills in the matter of congestion and an advance in the Plate base is considered imminent.

It is only mildly stating the case to say that in important finished lines September sales have exceeded all records. Steel Bar business is very heavy, the advances in Bar Iron now making Steel the cheaper material. No advance in Steel Bars has been made nor do leading manufacturers expect an advance. Wrought Pipe has been in excellent demand, albeit prices do not advance. Sheets have improved steadily. Tin Plate lags, though some large business has been done with the Pacific Coast canning trade. September has always been active in the Wire trade and this month has emphasized the record.

## A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

Sept. 27, Sept. 20, Aug. 30, Sept. 28,  
1905. 1905. 1905. 1904.

### PIG IRON:

|   |         |         |         |         |
|---|---------|---------|---------|---------|
| Foundry Pig No. 2, Standard, Philadelphia ..... | \$16.75 | \$16.50 | \$16.25 | \$14.25 |
| Foundry Pig No. 2, Southern, Cincinnati .....   | 14.75   | 14.25   | 14.50   | 12.00   |
| Foundry Pig No. 2, Local, Chicago .....         | 16.50   | 16.00   | 16.25   | 13.50   |
| Bessemer Pig, Pittsburgh .....                  | 16.35   | 15.85   | 15.35   | 12.85   |
| Gray Forge, Pittsburgh .....                    | 15.10   | 14.60   | 14.35   | 11.75   |
| Lake Superior Charcoal, Chicago .....           | 17.00   | 17.00   | 16.50   | 14.75   |

### BILLETS, RAILS, &c.:

|   |       |       |       |       |
|---|-------|-------|-------|-------|
| Bessemer Steel Billets, Pittsburgh .....      | 25.00 | 25.00 | 24.00 | 19.50 |
| Steel Forging Billets, Pittsburgh .....       | 29.00 | 29.00 | 27.00 | ....  |
| Open Hearth Steel Billets, Philadelphia ..... | 27.00 | 27.00 | 27.00 | 21.50 |
| Steel Billets, Chicago .....                  | ....  | ....  | 29.00 | 22.50 |
| Wire Rods, Pittsburgh .....                   | 31.50 | 31.00 | 31.00 | 26.00 |
| Steel Rails, Heavy, Eastern Mill .....        | 28.00 | 28.00 | 28.00 | 28.00 |

### OLD MATERIAL:

|                                     |       |       |       |       |
|-------------------------------------|-------|-------|-------|-------|
| O. Steel Rails, Chicago .....       | 14.50 | 14.50 | 14.50 | 11.00 |
| O. Steel Rails, Philadelphia .....  | 16.25 | 16.25 | 16.00 | 12.25 |
| O. Iron Rails, Chicago .....        | 21.00 | 22.00 | 20.00 | 16.00 |
| O. Iron Rails, Philadelphia .....   | 22.00 | 22.00 | 20.50 | 15.50 |
| O. Car Wheels, Chicago .....        | 16.00 | 16.00 | 15.50 | 11.00 |
| O. Car Wheels, Philadelphia .....   | 15.50 | 15.00 | 15.50 | 12.00 |
| Heavy Steel Scrap, Pittsburgh ..... | 16.00 | 16.00 | 15.50 | 11.50 |
| Heavy Steel Scrap, Chicago .....    | 14.50 | 14.50 | 13.75 | 10.00 |

### FINISHED IRON AND STEEL:

|  |       |       |       |       |
|--|-------|-------|-------|-------|
| Refined Iron Bars, Philadelphia .....          | 1.68½ | 1.68½ | 1.63½ | 1.43½ |
| Common Iron Bars, Chicago .....                | 1.65  | 1.65  | 1.60  | 1.35  |
| Common Iron Bars, Pittsburgh .....             | 1.74½ | 1.74½ | 1.60  | 1.30  |
| Steel Bars, Tidewater .....                    | 1.64½ | 1.64½ | 1.64½ | 1.44½ |
| Steel Bars, Pittsburgh .....                   | 1.50  | 1.50  | 1.50  | 1.30  |
| Tank Plates, Tidewater .....                   | 1.74½ | 1.74½ | 1.74½ | 1.54½ |
| Tank Plates, Pittsburgh .....                  | 1.60  | 1.60  | 1.60  | 1.40  |
| Beams, Tidewater .....                         | 1.89½ | 1.89½ | 1.89½ | 1.54½ |
| Beams, Pittsburgh .....                        | 1.70  | 1.70  | 1.70  | 1.40  |
| Angles, Tidewater .....                        | 1.89½ | 1.89½ | 1.89½ | 1.54½ |
| Angles, Pittsburgh .....                       | 1.70  | 1.70  | 1.70  | 1.40  |
| Skelp, Grooved Steel, Pittsburgh .....         | 1.50  | 1.50  | 1.50  | 1.30  |
| Skelp, Sheared Steel, Pittsburgh .....         | 1.55  | 1.55  | 1.55  | 1.35  |
| Sheets, No. 27, Pittsburgh .....               | 2.20  | 2.20  | 2.20  | 2.00  |
| Barb Wire, Galvanized, f.o.b. Pittsburgh ..... | 2.20  | 2.20  | 2.15  | 2.05  |
| Wire Nails, f.o.b. Pittsburgh .....            | 1.75  | 1.75  | 1.70  | 1.60  |
| Cut Nails, Mill .....                          | 1.60  | 1.60  | 1.60  | 1.60  |

### METALS:

|   |       |       |       |       |
|---|-------|-------|-------|-------|
| Copper, New York .....                                    | 16.25 | 16.00 | 17.00 | 12.75 |
| Spelter, St. Louis .....                                  | 5.80  | 5.85  | 5.55  | 5.00  |
| Lead, New York .....                                      | 4.85  | 4.85  | 4.80  | 4.20  |
| Lead, St. Louis .....                                     | 4.75  | 4.72½ | 4.77½ | 4.12½ |
| Tin, New York .....                                       | 32.10 | 32.00 | 33.00 | 27.85 |
| Antimony, Hallett, New York .....                         | 12.75 | 14.00 | 14.50 | 7.00  |
| Nickel, New York .....                                    | 40.00 | 40.00 | 40.00 | 40.00 |
| Tin Plate, Domestic, Bessemer, 100 pounds, New York ..... | 3.74  | 3.74  | 3.74  | 3.49  |

## Chicago.

FISHER BUILDING, September 27, 1905.—(By Telegraph.)

The buying of practically all lines of Iron and Steel products in this market during the week has been almost unprecedented. Consumers generally have been anticipating future requirements, believing that not only will higher prices soon prevail but that there will be a shortage of both Pig Metal and certain finished products before the end of the year. Rail orders aggregating more than 100,000 tons have been proffered the local mill during the week, but could not be accepted, as deliveries were desired before November, 1906. Last year the overflow tonnage was taken and transferred to Pittsburgh for this year's rolling, but the overflow for 1906 will be permitted to go to mills outside the United States Steel Corporation, principally in the East, where water shipments can be secured. The annual Rail requirements of Western roads have outgrown the output of the local mill fully 50 per cent. and the necessity of increasing its capacity is apparent. Large distributing interests have been placing contracts for Finished Steel with the mills for delivery well through the first half of 1906. The Pig Iron market has been unusually active, sales for the week, made up largely of small lots, aggregating 75,000 tons. Several large Southern producers have temporarily withdrawn prices and local furnaces are sold up through the remainder of the year. Southern Iron has been advanced 50c. a ton by some of the leading interests and Northern brands have also been slightly advanced. Bar Iron has been marked up another \$1 and Iron Plates shared a similar advance last week. The Sheet market is firmer, but Merchant Pipe does not respond to the heavy buying movement which set in early in August and which has continued since. There is no let up in the demand for Track Supplies and the tonnage

placed this month exceeds all records. Jobbers' stocks of Structural Material in this district are being heavily drawn upon for immediate delivery to both Atlantic and Pacific Coast points. The average price for this material is 2.50c., f.o.b. Chicago, and on certain sizes as high as 3c. is procured.

**Pig Iron.**—Sales of all grades of Iron, made up largely of small lots ranging from 200 to 2000 tons and aggregating about 75,000 tons, were made during the week. Consumers generally covered requirements through the first quarter of next year and in a few instances succeeded in placing their allotment through the first half. Local furnaces are practically sold up for the remainder of the year and several large Southern producers have temporarily withdrawn quotations. The largest sale noted for the week was for 5000 tons, purchased by a Michigan foundry and made up of both Northern and Southern grades. While Southern Iron has been advanced 50c. a ton practically all of the tonnage was placed on the basis of \$12, Birmingham, and only a few small lots have been placed this week at the advanced price. The largest Southern producer of Foundry Iron is sold up for the remainder of the year, not only on Foundry but Forge and Mottled as well. Northern Foundry grades have also advanced slightly and further advances are anticipated. Consumers that failed to cover are in the market this week and the tonnage promises to be heavy. The report that one of the largest Foundry Iron buyers in the West is in the market for an additional large tonnage has been denied, as the present requirements cover only a small lot to fill in. The following quotations represent the prices quoted on current Iron and at the maximum prices named the furnaces are taking business through the first quarter of next year:

|  |                    |
|--|--------------------|
| Lake Superior Charcoal.....                | \$17.00 to \$17.50 |
| Northern Coke Foundry, No. 1.....          | 17.00 to 17.25     |
| Northern Coke Foundry, No. 2.....          | 16.50 to 17.00     |
| Northern Coke Foundry, No. 3.....          | 16.25 to 16.50     |
| Northern Scotch, No. 1.....                | 17.50 to 17.75     |
| Ohio Strong Softeners, No. 1.....          | 17.55 to 18.05     |
| Ohio Strong Softeners, No. 2.....          | 17.05 to 17.55     |
| Southern Silvery, 4 to 6 per cent. Silicon | 17.15 to 18.15     |
| Southern Coke, No. 1.....                  | 16.15 to 16.65     |
| Southern Coke, No. 2.....                  | 15.65 to 16.15     |
| Southern Coke, No. 3.....                  | 15.15 to 15.65     |
| Southern Coke, No. 4.....                  | 14.90 to 15.40     |
| Southern Coke, No. 1 Soft.....             | 16.15 to 16.65     |
| Southern Coke, No. 2 Soft.....             | 15.65 to 16.15     |
| Southern Gray Forge.....                   | 14.65 to 15.15     |
| Southern Mottled and White.....            | 14.40              |
| Malleable Bessemer.....                    | 16.75 to 17.25     |
| Standard Bessemer.....                     | 17.30              |
| Jackson Co. and Ky. Silvery, 6 % Silicon   | 18.30 to 18.80     |
| Jackson Co. and Ky. Silvery, 8 % Silicon   | 19.30 to 20.30     |
| Jackson Co. and Ky. Silvery, 10 % Silicon  | 20.30 to 21.30     |
| Alabama Basic.....                         | 16.90              |

**Metals.**—The Copper market has advanced slightly, while Tin is weak. Spelter continues practically unchanged, and while a few buyers look for lower prices it is doubtful if they will be made in view of the high price prevailing for Ore. We quote: Casting Copper, 16½c. to 16½c.; Lake, 16½c.; Pig Tin, car lots, 32½c. to 33c.; small lots, 33½c. to 34c.; Spelter, prompt delivery, 6.05c. for car lots; Lead, Desilverized, 4.80c.; Corroding, 4.90c. for 50-ton lots; on car lots, 2½c. per 100 lbs. higher; Light Brass, 7½c. Sheet Zinc is \$7.50 list, f.o.b. Lasalle, in car lots of 600-lb. casks. On Old Metals we quote: Copper Wire, 14c.; Heavy Copper, 13½c.; Copper Bottoms, 12½c.; Copper Clips, 13½c.; Red Brass, 12½c.; Red Brass Borings, 10½c.; Yellow Brass, Heavy, 9½c.; Yellow Brass Borings, 7½c.; Light Brass, 7½c.; Lead Pipe, 4c.; Tea Lead, 3½c.; Zinc, 4½c.; Pewter, No. 1, 21c.; Block Tin Pipe, 27½c.

(By Mail.)

**Billets.**—Forging Billets, in large lots, are quoted at \$30 for base sizes, with the usual extras, and \$32 in carload lots. Demand is heavy and shipments cannot be made in less than 30 days. When the new Structural mill of the Illinois Steel Company is placed in operation the tonnage of Billets that can be offered will be very small, and until the additional seven Open Hearth furnaces are completed, plans for which are now being prepared, there will be a shortage of Billets in this market.

**Rails and Track Supplies.**—Western roads continue to place large contracts for Rails for 1906 delivery. The local mill was compelled to turn away orders for more than 100,000 tons during the past week, as deliveries could not be promised until November, next year. Most of this business was placed with outside Eastern mills and the material will be shipped by water. Last year the Illinois Steel Company was compelled to transfer orders for Western roads aggregating about 200,000 tons, and the Rail requirements of Western roads for several years have been greatly in excess of the capacity of the local mill. It is apparent that the Rail output must be greatly increased to meet the requirements of these roads. Contracts for Track Supplies placed thus far this month exceed those of any other month in the history of the trade. These include Spikes, Track Bolts and Angle Bars. Angle Bars accompanying Rail orders for 1906 delivery are quoted at 1.50c.; in carload lots, 1.75c. We quote Spikes at 1.80c. to 1.90c., and Track Bolts are unchanged at 2.40c. to 2.50c., base, Square Nuts.

Store prices on Track Supplies range from 15c. to 20c. above mill prices. The buying of Light Rails is heavy and sections ranging from 30 to 45 lbs. are quoted at \$25; 25-lb., \$26; 20-lb., \$27; 16-lb., \$28; 12-lb., \$29; lighter sections down to 8-lb., \$30 to \$35, f.o.b. mill. Standard Sections are quoted at \$28, f.o.b. mill, with full freight to destination.

**Structural Material.**—Local stocks are now being heavily drawn upon for quick shipment of material, not only to coast points in the East but to the Pacific Coast as well. The average price on assorted sizes is 2.50c., f.o.b. Chicago, and as high as 3c. is quoted on certain small sizes. Large contracts for future delivery have been placed by local jobbers during the week, and despite the deferred deliveries that can be promised by the mills both jobbers and consumers are endeavoring to get under cover in order to secure early deliveries next year. Structural Material for future delivery from mill in car lots or greater is quoted as follows: Beams and Channels, 3 to 15 inches, inclusive, 1.86½c.; Angles, 3 to 6 inches, ¼-inch and heavier, 1.86½c.; Angles larger than 6 inches on one or both legs, 1.96½c.; Beams, larger than 15 inches, 1.96½c.; Zees, 3 inches and over, 1.86½c.; Tees, 3 inches and over, 1.91½c., in addition to the usual extras for cutting to extra lengths, punching, coping, bending or other shop work. Store prices on Angles, Beams and Channels range from 2.50c. to 3c., according to quantity on hand in store or obtainable from mill.

**Plates.**—A large tonnage is pending for lake shipyards and will be placed shortly. Shipyard requirements already placed are for delivery well through the first quarter of next year. From the local mill only a small tonnage is available during the month of December. Eastern mills, as previously noted, are in position to make deliveries within two weeks and are securing the bulk of the prompt business. As in Structural Shapes, large jobbers are covering future requirements and large contracts have been placed during the week. Several central Pennsylvania mills have advanced Iron Plates \$1 a ton. Prices are unchanged, as follows: Tank quality, ¼-inch and heavier, wider than 6¼ and up to 100 inches wide, inclusive, car lots, Chicago, 1.76½c.; 3-16 inch, 1.86½c.; Nos. 7 and 8 gauge, 1.91½c.; No. 9, 2.01½c.; Flange quality in widths up to 100 inches, 1.86½c., base, for ¼-inch and heavier, with the same advances for lighter weights; Sketch Plates, Tank quality, 1.86½c.; Flange quality, 1.96½c. Store prices on Plates are as follows: Tank Plate, ¼-inch and heavier, up to 72 inches wide, 2c. to 2.10c.; from 72 to 96 inches wide, 2.10c. to 2.20c.; 3-16 inch up to 60 inches wide, 2.10c. to 2.20c.; 72 inches wide, 2.35c. to 2.45c.; No. 8 up to 60 inches wide, 2.10c. to 2.15c.; Flange quality, 25c. extra.

**Sheets.**—Low prices on Black Sheets have been withdrawn by practically all of the mills and only on immediate specifications can as low as 2.20c. be done, while on contracts for future delivery most of the mills are quoting on the basis of 2.30c. for 28 gauge, and in rare instances where the tonnage is desirable 2.25c. can be done. Sheet Bars to outside mills for the month of October on sliding scale contracts will be quoted at \$26, Pittsburgh, which leaves the mills only a small margin of profit on the 2.30c. basis. Demand from store has improved. Current prices are as follows: Blue Annealed, Nos. 9 and 10, 1.81½c. to 1.86½c.; Box Annealed, Nos. 18 and 20, 2.16½c. to 2.21½c.; No. 27, 2.31½c. to 2.36½c.; No. 28, 2.41½c. to 2.46½c., with the customary differentials between gauges. Store prices are 2c. to 2.10c. for No. 10 Blue, 2.05c. to 2.15c. for No. 12 Box, 2.10c. to 2.20c. for No. 14, 2.20c. to 2.30c. for No. 16, 2.40c. to 2.50c. for Nos. 18 and 20, 2.50c. for Nos. 22 and 24, 2.55c. to 2.65c. for No. 26, 2.60c. to 2.70c. for No. 27, 2.70c. to 2.80c. for No. 28, 2.95c. to 3.05c. for No. 30. Galvanized Sheets are quoted in car lots from mill at the following prices: No. 10, 2.41½c. to 2.46½c.; Nos. 17 to 21, 2.81½c. to 2.86½c.; No. 27, 3.26½c. to 3.31½c.; No. 28, 3.46½c. to 3.56½c. Store prices on Galvanized Sheets are firmer than for some time and high prices are being demanded for sizes difficult to obtain. Prices are as follows: Nos. 10, 12 and 14, 3.10c. to 3.20c.; Nos. 16 to 20, 2.90c. to 3c.; Nos. 22 to 24, 3c. to 3.15c.; No. 26, 3.20c. to 3.35c.; No. 27, 3.40c. to 3.55c.; No. 28, 3.60c. to 3.75c.; No. 30, 4.85c. to 4.95c.

**Bars.**—Iron Bars have been advanced \$1 a ton, the leading interest now holding firmly at 1.70c. On Steel Bars consumers are advised to send in specifications for requirements 60 to 90 days in the future. An advance of \$2 a ton on Steel Bars is expected at an early date, although one of the large interests is in favor of maintaining the present price and placing any advance on the premium basis. We quote: Iron Bars, 1.65c. to 1.70c.; Steel Bars, 1.66½c., both half extras; Hoops, 1.91½c., extras as per Hoop card; Bands, 1.66½c., as per Steel card; Soft Steel Angles and Shapes, 1.76½c., half extras, and Hard Steel Angles and Bars at about 10c. below the price of Soft Steel. In store prices Steel Bars and Bands are being held at a minimum of 1.85c., base, half extras; Steel Angles and Shapes, 1.95c., half extras, and Soft Steel Hoops, 2.20c., full extras, with 5c. to 10c. higher than the minimum prices named for small quantities from store.

**Merchant Steel.**—Large interests continue to cover requirements to July, next year. The movement from store continues heavy, and dealers are experiencing considerable difficulty in securing shipments from mill to keep up their stocks. Current quotations are as follows: Smooth Finished Machinery Steel, 1.91½¢; Smooth Finished Tire, 1.86½¢; Flat Sleigh Shoe, 1.71½¢; Concave and Convex Sleigh Shoe, 1.86½¢; Cutter Shoe, 2.40¢; Toe Calk Steel, 2.21½¢; Railway Spring, 1.86½¢; Crucible Tool Steel, 6½¢ to 8¢; special grades of Tool Steel, 13¢ and up; Shafting, 50 per cent. discount in car lots and 45 per cent. in less than car lots, in base territory.

**Merchant Pipe.**—Low prices continue to prevail, despite the volume of new business that is being placed with both the leading interest and independent mills. With Steel Skelp quoted at 1.65¢, Pittsburgh, no profit remains to the independent producer who is compelled to buy his raw material with the discounts prevailing at 80 and 81 per cent. The bulk of the business is being placed at the former price, but where competition has been keen 81 per cent. has been done. On sizes 12 inches and over the leading interest has tonnage booked well into next year, and large contracts have recently been placed for oil country goods. The Lorain plant of the National Tube Company will be in full operation in October and heavy shipments are already being made on small sizes. With this plant in full operation immediate delivery of Merchant Pipe is assured in this market. Current discounts to consumers from mill on Black Steel Pipe are 77.35 to 77.85 per cent. on the base sizes, ¾ to 6 inches, and Galvanized is quoted at 10 per cent. less. Iron Pipe is held at from 1½ to 2 points higher. From store in small lots, Chicago, jobbers are quoting 76½ to 77 per cent.

**Boiler Tubes.**—Locomotive, marine and stationary boiler requirements continue unusually heavy and prices are firm and well maintained. Official discounts, f.o.b. Chicago, in car lots, are as follows: Steel Tubes, 62.35; Iron, 51.35; Seamless, 50.35. Store prices are unchanged, as follows:

|                          | Steel. | Iron. | Seamless. |
|--------------------------|--------|-------|-----------|
| 1 to 1½ inches.....      | 40     | 35    | 42½       |
| 1½ to 2¼ inches.....     | 50     | 35    | 35        |
| 2½ inches.....           | 52½    | 35    | 30        |
| 2½ to 5 inches.....      | 60     | 47½   | 42½       |
| 6 inches and larger..... | 50     | 35    | ..        |

**Cast Iron Pipe.**—On October 12 Portland, Ore., will award contracts on 700 tons of small Pipe, and on Saturday, September 30, the city of Chicago will award contracts for approximately 200 tons of 16-inch Pipe and 500 tons of 30-inch Pipe. Demand for small lots is heavy. Prices on current business are as follows, f.o.b. Chicago, per net ton: Water Pipe, 4-inch, \$29.50; 6, 8 and 10 inch, \$28.50; 12-inch and larger, \$27.50 per net ton, f.o.b. Chicago, with \$1 extra for Gas Pipe. Large municipal contracts are, of course, placed at lower basis than this.

**Coke.**—Foundry Coke is higher and Connellsville producers are asking \$2.60 to \$2.65 at the ovens for both prompt and future shipment, which is equivalent to \$5.25 to \$5.30, Chicago. Foundries throughout the West are hurrying foundry shipments in order to provide a stock against delayed movement of Coke, which is anticipated later in the year on account of the inevitable car shortage. Connellsville Furnace Coke for delivery the remainder of the year is strong at \$2.30 to \$2.35 at the ovens, and for delivery next year \$2.50 is asked. The freight rate on Furnace Coke for delivery to blast furnaces is \$2.35 from the Connellsville field.

**Old Materials.**—The Chicago, Burlington & Quincy Railroad this week closed a list aggregating about 2000 tons. On the railroad lists closed last week slightly higher prices were secured for Wrought Scrap, but on the other commodities our quotations of last week prevailed. The Old Material situation is rather peculiar at present owing to the heavy stocks which dealers are carrying in anticipation of still higher prices in the future. On the other hand, the offerings of the railroads continue heavy and the tonnage that is going to consumers is not nearly as great as that taken from the railroads by the dealers. One of the largest consumers in this district is credited with having a stock of 50,000 tons on hand, most of which was accumulated at exceedingly low prices, and the present buying of this concern is limited almost entirely to picking up lots that are offered at desirable prices. The range of prices paid by large consumers to producers and dealers in car lots, f.o.b. Chicago, is as follows:

|  |                    |
|--|--------------------|
| Old Iron Rails.....                              | \$21.00 to \$21.50 |
| Old Steel Rails, 4 feet and over.....            | 15.50 to 16.00     |
| Old Steel Rails, less than 4 feet.....           | 14.50 to 15.00     |
| Heavy Relaying Rails, subject to inspection..... | 26.50 to 27.00     |
| Old Car Wheels.....                              | 16.00 to 16.50     |
| Heavy Melting Steel Scrap.....                   | 14.50 to 15.00     |
| Frogs, Switches and Guards.....                  | 14.50 to 15.00     |
| Mixed Steel.....                                 | 11.50 to 12.00     |

The following quotations are per net ton:

|                             |                    |
|-----------------------------|--------------------|
| Iron Fish Plates.....       | \$18.00 to \$18.50 |
| Iron Car Axles.....         | 23.50 to 24.00     |
| Steel Car Axles.....        | 17.50 to 18.00     |
| No. 1 Railroad Wrought..... | 16.75 to 17.25     |

|   |                |
|---|----------------|
| No. 2 Railroad Wrought.....                 | 15.75 to 16.25 |
| Locomotive Tires, smooth.....               | 14.25 to 14.50 |
| Railway Springs.....                        | 13.75 to 14.25 |
| No. 1 Dealers' Forge.....                   | 12.50 to 13.00 |
| Wrought Pipes and Flues.....                | 12.00 to 12.50 |
| No. 1 Cut Bushing.....                      | 12.00 to 12.50 |
| Iron Axle Turnings.....                     | 11.00 to 11.25 |
| Soft Steel Axle Turnings.....               | 10.75 to 11.25 |
| Machine Shop Turnings.....                  | 10.75 to 11.00 |
| Cast Borings.....                           | 9.00 to 9.25   |
| Mixed Borings, &c.....                      | 9.00 to 9.25   |
| No. 1 Mill.....                             | 9.50 to 10.00  |
| Country Sheet.....                          | 8.25 to 8.50   |
| No. 1 Boilers, cut to Sheets and Rings..... | 11.75 to 12.25 |
| No. 1 Cast Scrap.....                       | 13.50 to 14.00 |
| Stove Plate and Light Cast Scrap.....       | 11.00 to 11.50 |
| Railroad Malleable.....                     | 14.75 to 15.25 |
| Agricultural Malleable.....                 | 13.25 to 13.75 |

## Philadelphia.

REAL ESTATE TRUST BUILDING, September 26, 1905.

The Iron and Steel markets have become very strong during the past few days and there is some fear that prices may begin to move too rapidly. The present difficulty is not to find buyers, but to limit the amount that each buyer can have. It is quite true that they are willing to pay higher prices for the accommodation, but when every buyer wants twice or three times his usual quantity sellers have to do something to protect themselves. They began by asking higher prices, but as they have not reached a point high enough to check the demand they are now trying to avoid quoting at all. Most of the furnaces are sold up for 1905, with some business entered for 1906, and considering the unusually favorable outlook there is a general disposition to postpone further commitments. There can be little doubt that if producers of Pig Iron would open their books indiscriminately they would soon be loaded with business, but as they have not had a very profitable business so far during 1905 they want a little leeway during the remainder of the year if it is possible to get it. Moreover, the advance of 50¢ to \$1 per ton already realized cuts very little figure in view of the increased cost of production. It appears to be difficult to maintain a good margin at any time, but especially so in times like these. Fifty cents to \$1 per ton advance in prices looks well on paper and sounds well, too, but the inevitable advance in cost quickly follows and absorbs most of the cream. When the return trip begins prices have to go a long way before costs decrease; hence the desire of all producers of Pig Iron to avoid rapid advances, which are always more or less illusive. It is strange but true that buyers are almost invariably responsible for unwarrantably high prices. Every advance whets the appetite for a new purchase, until finally, when the evidences of a genuine scarcity fail to materialize, buying drops off, prices begin to weaken and the "boom," or the expected "boom," vanishes into thin air. This does not necessarily apply to the immediate conditions, although it certainly will apply ultimately. At the moment all the indications favor higher prices. Consumption is enormous and the last quarter of 1905 is almost certain to surpass all former records. Under such conditions prices must advance. Higher prices are necessary to stimulate an increased production, without which a famine in Iron could hardly be avoided. There is no speculation in this statement. The requirements of consumers are too obvious to require explanation in detail, and they will continue to be so for all this year and apparently for an indefinite period beyond that time. Business has been good most of the time for a year past, but the big movement is believed to be only just beginning.

**Pig Iron.**—There is more real strength to the market than there has been for several years past. Prices may not advance as rapidly, but the underlying conditions are believed to be safer and stronger than at any time within the memory of the most experienced men in the trade. We have greater facilities for doing business, we have larger and more valuable crops and the country is in every respect stronger and richer than ever before, while its standing as a world Power is pre-eminent. Trade is improving the world over and 1906 promises to be a period of expansion that will surpass all records in the demand for Iron and Steel and its various products. It would be presumptuous to attempt to define the limits of the coming movement, but when there is all the business that can be handled it will be satisfaction enough without guessing at tonnages. The railroads are the heaviest consumers and they have already given out more work for next year than during any similar period in the past. The Wire and the Pipe mills are also filling up very rapidly. The shipyards are also well in advance of any former period, and besides these leading interests the rank and file in all lines have about all the business they can attend to. The last named will be greatly stimulated by the excellent crops. This is already felt in the more distant country districts, and even in Pennsylvania and New Jersey the banks report unusually prosperous conditions among the farmers, truckers and fruit raisers. All the elements—and in nearly all sections of the country—will therefore be conducive to business activity, so that with such an assured demand for Iron prices are pretty sure to

work higher. A great deal of business was done last week at about \$16.50 for No. 2 X Foundry, but \$16.75 would be an inside price to-day, while some quote \$17 firm and are likely enough to get it before the week is out. Many buyers want to get quotations for deliveries during the first half of 1906, but makers discourage business of that kind and either quote extra prices or decline to quote at all. Mill Irons are still somewhat irregular and are said to have been sold as low as \$14.50 during last week, but since then business has been done at \$15 to \$15.50. Quotations on Southern Irons are withdrawn temporarily. Last sales were on the basis of \$12.50, f.o.b., for No. 2 X Foundry, and it is possible that more business will be taken on that basis, but for the present they are not quoting any prices. Basic Iron is much stronger. Large lots have been taken at \$16, but 25c. to 50c. more than that is asked to-day, and it is doubtful if anything could be had for less than \$16.25, as there is very little of that grade to be had for this year's delivery and more money is wanted for 1906 Iron. Prices are liable to sudden changes, but at the moment the range is as follows for Philadelphia and nearby deliveries:

|                          |                    |
|--------------------------|--------------------|
| No. 1 X Foundry.....     | \$17.25 to \$17.50 |
| No. 2 X Foundry.....     | 16.75 to 17.00     |
| No. 2 Plain.....         | 16.25 to 16.50     |
| Standard Gray Forge..... | 15.00 to 15.50     |
| Basic.....               | 16.00 to 16.50     |
| Low Phosphorus.....      | 20.75 to 21.25     |

**Spiegeleisen.**—No sales reported recently, although Spiegel is wanted at about \$26.50 to \$27, but is not immediately available at less than \$27.50 to \$28 for 20 per cent. Spiegel.

**Ferromanganese.**—Prices are higher and \$54.50 to \$55 would have to be paid for early deliveries of 50 per cent. Ferro. There is quite a scarcity of this article, so that prices are likely to be rather erratic until normal conditions are restored.

**Steel.**—There is a heavy demand and prices are strong, with an advancing tendency. Large lots have been taken at \$27 to \$27.50 for ordinary Steel and at from \$33 to \$35 for Forging Billets.

**Muck Bars.**—No sales of recent date, but sellers now quote \$27 to \$27.50, f.o.b. cars their mills.

**Plates.**—Business is increasing and most of the mills have more orders on their books than they have had for a long time past. The demand is not confined to any one line in particular, but includes consumers of every degree, big and little, indicating activity in every department of trade. Prices are unchanged, but it is expected that an advance will be made during the coming month. Meanwhile quotations are as follows:

|  | Carload.<br>Cents. | Part<br>carload.<br>Cents. |
|--|--------------------|----------------------------|
| Tank, Bridge and Boat Steel.....   | 1.73½              | 1.78½                      |
| Flange or Boiler Steel.....  | 1.83½              | 1.88½                      |
| Marine, A. B. M. A. and Commercial   |                    |                            |
| Fire Box Steel.....  | 1.93½              | 1.98½                      |
| Still Bottom Steel.....  | 2.03½              | 2.08½                      |
| Locomotive Fire Box Steel.....   | 2.23½              | 2.28½                      |
| The above are base prices for ¼-inch and heavier. The follow-<br>ing extras apply: Per 100 |                    |                            |
| 3-16-inch thick.....   | \$0.10             | pounds extra.              |
| Nos. 7 and 8, B. W. G.....   | .15                | "                          |
| No. 9, B. W. G.....  | .25                | "                          |
| Plates over 100 to 110 inches.....   | .05                | "                          |
| Plates over 110 to 115 inches.....   | .10                | "                          |
| Plates over 115 to 120 inches.....   | .15                | "                          |
| Plates over 120 to 125 inches.....   | .25                | "                          |
| Plates over 125 to 130 inches.....   | .50                | "                          |
| Plates over 130 inches.....  | 1.00               | "                          |

**Structural Material.**—The same old story must be repeated week after week. Mills crowded with orders and therefore compelled to decline a great deal of very desirable business, but they are simply unable to handle it. Quotations are nominally as follows, but special rates are necessary to secure deliveries during 1905: Beams and Channels, up to 15 inches, 1.83½c. to 2c., and a tenth more for large sizes, and about the same schedule for Angles.

**Bars.**—A good volume of business could be had at 1.63½c., but in most cases mills ask a half tenth to a tenth more for best Refined Iron and are taking in a few good orders. Prospects for higher prices are very encouraging, and it is believed that a large business will be done during the fall months at satisfactory price. Steel Bars are in good demand at 1.63½c. to 1.73½c. and Refined Iron at about the same figures—viz., 1.63½c. to 1.73½c.

**Sheets.**—Business is much better, mills having gained considerable tonnage during the past week or two. Prices, however, are unchanged, as follows: 18 to 20 gauge, 2.30c.; 22 to 24 gauge, 2.40c.; 25 and 26 gauge, 2.50c.; 27 gauge, 2.60c., and 28 gauge, 2.70c.

**Old Material.**—The market is in a peculiar condition, consumers of Steel Scrap having practically withdrawn from the market at the high figures which dealers quote on that class of material. Rolling Mill Scrap is quite firm, however, and in many cases higher prices are paid than during the week previous. Bids and offers are about as follows for deliveries in consumers' yards:

|  |                    |
|--|--------------------|
| Scrap Steel Rails.....                 | \$16.25 to \$16.50 |
| No. 1 Steel Scrap.....                 | 15.75 to 16.25     |
| Low Phosphorus Scrap.....              | 21.00 to 22.00     |
| Old Steel Axles.....                   | 21.00 to 21.50     |
| Old Iron Axles.....                    | 25.00 to 25.50     |
| Old Iron Rails.....                    | 22.00 to 23.00     |
| Old Car Wheels.....                    | 15.50 to 16.00     |
| Choice Scrap, R. R. No. 1 Wrought..... | 20.50 to 21.50     |
| No. 1 Yard Scrap.....                  | 18.50 to 19.00     |
| Long and Short.....                    | 17.50 to 18.00     |
| Machinery Scrap.....                   | 15.50 to 16.00     |
| Wrought Iron Pipe.....                 | 15.75 to 16.25     |
| No. 1 Forge Fire Scrap.....            | 15.00 to 15.50     |
| No. 2 Light Ordinary.....              | 12.00 to 12.50     |
| Wrought Turnings.....                  | 13.75 to 14.25     |
| Axle Turnings, Choice Heavy.....       | 14.50 to 15.00     |
| Cast Borings.....                      | 9.75 to 10.00      |
| Stove Plates.....                      | 12.50 to 13.00     |
| Grate Bars.....                        | 12.00 to 12.75     |

C. H. Newcomb, who has represented Matthew Addy & Co. in the Philadelphia district for several years, has been appointed as the representative of Crocker Brothers of New York, with offices in the Pennsylvania Building, Fifteenth and Chestnut streets, Philadelphia.

## Pittsburgh.

PARK BUILDING, September 27, 1905.—(By Telegraph.).

**Pig Iron.**—The situation in the Pig Iron market is rapidly assuming boom proportions, and whether the large interests that so strongly favor a conservative market without any undue advances in prices will be able to hold the market in check seems now rather doubtful. Some very heavy inquiries for Foundry and Forge Iron are in the market, and a good deal of tonnage has been sold. Some furnaces have withdrawn entirely as sellers, and others have advanced their prices 50c. a ton or more. The Westinghouse Air Brake Company has bought a considerable tonnage of Bessemer and Foundry, and the Westinghouse Electric & Mfg. Company will close to-day (Wednesday) for 10,000 tons or more of Foundry and Forge, all for first quarter delivery. The Air Brake Company bought Bessemer Iron in broken Pigs at a shade under \$15, Valley furnace, or about \$15.70, Pittsburgh. For the Foundry Iron it paid upward of \$15, Valley furnace. The Electric Company will buy Nos. 1 to 4 Foundry, and prices will likely be on the basis of \$15, Valley furnace, for Northern No. 2. The Standard Sanitary Mfg. Company has bought about 3000 tons of Southern Foundry for its Louisville works on the basis of \$12, Birmingham, for No. 2 Foundry. This company is also in the market for a large tonnage of Iron for its works at New Brighton, Pa. The United States Steel Corporation has bought a total of 80,000 tons of Bessemer this month and is expected to buy about 40,000 tons for October delivery. The absolute minimum of the market on Bessemer and Basic seems to be \$15.50, Valley furnace, and some sellers are disposed to hold their Iron, believing the market will go still higher. Northern No. 2 Foundry is \$15 minimum, Valley furnace, but this price is made by only a few sellers, most sellers holding their Iron for \$15.50 at furnace. The recent active demand for Forge Iron has brought about a sharp advance in prices, and Northern Forge is now held firmly at \$14.25 to \$14.50, Valley furnace, most sellers asking the latter price. A local consumer is in the market for 3000 tons of Gray Forge and it is likely to be closed this week at \$14.50, Valley furnace.

**Steel.**—We note a continued heavy inquiry for Billets, Sheet and Tin Bars, and the available supply is very limited. One consumer wants 12,000 tons of Open Hearth Billets, but the business has not yet been closed. Bessemer Billets readily command \$25, maker's mill, and Open Hearth Billets \$26 or higher, the latter being very scarce and hard to get at any price. Forging Billets bring \$28 and higher, depending on specifications.

**Railroad Spikes.**—Local makers have advanced prices and now quote \$1.75 per 100 lbs. in carload lots, maker's mill, this price being absolute minimum of the market.

**Chain Rods.**—The high prices and scarcity of Open Hearth Steel have caused a sharp advance in prices of Chain Rods, which are now held at \$35 for Open Hearth stock, f.o.b. maker's mill.

**Steel Bars.**—Reports in the daily press of an advance of \$2 a ton in prices of Steel Bars are incorrect, as no such advance has been made. The price of Steel Bars remains 1.50c., Pittsburgh, for carloads and larger lots.

(By Mail.)

The feature of the week has been the heavy inquiries for Foundry, Bessemer and Forge Iron, local consumers being in the market for 25,000 to 30,000 tons, deliveries on some of these inquiries to run through first half of next year. Owing to the active demand for Pig Iron and the probability of higher prices later in the year some of the leading sellers are inclined to retire from the market and pile their Iron, believing they will get more money for it before January 1. Consumers also evidently have the idea that prices will be higher and are trying to cover as far ahead as possible. Since our report of last week the United States Steel Corporation has bought 40,000 tons more of Bessemer Iron for

early delivery, the tonnage being divided between the Bessemer Pig Iron Association and the Shenango Furnace Company. This makes a total of 80,000 tons of Bessemer bought by the Steel Corporation for September and October, all which went at \$15, Valley furnace, except 15,000 tons sold early in the month, the price on which was \$14.50, at furnace. Prices on Foundry Iron are distinctly firmer, and Northern No. 2 is quite strong at \$14.75 to \$15, Valley furnace, most sellers refusing to shade the lower price. Indications are that a very large tonnage of Foundry will be closed up before this week is out. Northern Forge is also firmer and there is more inquiry for it than for some time. It is held at \$13.75 to \$14, Valley, and it looks as though it would go higher. Some heavy inquiries are in the market for Steel, one consumer inquiring for 12,000 tons of Open Hearth Billets, but this tonnage has not been placed, for the reason that a mill has not been found that is in shape to make deliveries wanted. Bessemer Billets would sell readily at \$25 and Open Hearth at \$26, maker's mill, but leading producers like Carnegie Steel Company and Jones & Laughlin Steel Company are turning away business at these prices, being unable to spare any Steel, needing their entire output for their own finishing mills and to fill contracts. Sheet and Tin Bars, in random lengths, are scarce and are held at \$26 to \$26.50, maker's mill. There promises to be a shortage in Coke, which is very scarce for prompt shipment, as high as \$2.35, at oven, being quoted on Connelville Furnace Coke for this year delivery. There is a good deal of inquiry for Scrap and prices are firm. In Finished Iron and Steel conditions are excellent, demand being heavy all along the line, except for Sheets and Tin Plate, which continue quiet. The Pipe trade is showing some betterment in demand, but prices continue low.

**Ferromanganese.**—During the week there has been a sharp advance of \$4 to \$5 a ton in Ferro, English 80 per cent. being held at this writing at \$55, and it is very hard to get even at this price. There is a great deal of trouble in getting out the Russian Ores used in making Ferro, owing to strikes and riots, and two of the leading English producers have stopped selling and are said to have turned buyers. There promises to be a distinct scarcity of Ferro for some time to come and we quote 80 per cent. foreign Ferro at \$55 to \$56, delivered, for large lots.

**Steel Rails.**—During the week the Carnegie Steel Company has entered orders for 50,000 to 60,000 tons of Rails for 1906 delivery. It is estimated that the total tonnage of Rails booked by the mills for next year delivery is between 1,000,000 and 1,100,000 tons, the Illinois Steel Company being credited with taking more than half of this. The Republic Iron & Steel Company has entered some good sized orders for Rails in the past two weeks. The great activity in Standard Sections has had a sympathetic effect on Light Rails, two of the Eastern mills having retired from the market as sellers. Prices of Light Rails are higher and we quote: 8-lb., \$36 to \$37; 10-lb., \$32 to \$33; 12-lb., \$29 to \$30; 16-lb., \$27 to \$28; 25-lb. to 45-lb., \$26 to \$26.50, all f.o.b. cars maker's mill. A large tonnage in Light Rails has been placed recently.

**Rods.**—The demand is showing betterment and prices are very firm. We quote Bessemer and Open Hearth Rods at \$31.50 to \$32 and Chain Rods at \$32.50 to \$33, maker's mill.

**Muck Bar.**—There is some inquiry for Muck Bar and prices are firmer. We quote best grades of Muck Bar, made from all Pig Iron, at \$26, Pittsburgh.

**Skelp.**—Prompt deliveries of both Iron and Steel Skelp are hard to obtain, the mills being well filled up with tonnage and very firm in their ideas as to prices. For ordinary widths we quote: Grooved Steel Skelp, 1.50c. to 1.55c.; Open Hearth, 1.55c. to 1.60c.; Sheared, \$1 advance; Grooved Iron Skelp, 1.55c. to 1.60c.; Sheared, 1.65c. to 1.70c., maker's mill.

**Plates.**—Contracts for Plates and other small Shapes for ten additional Lake Ore boats have recently been placed jointly with the Carnegie Steel Company and the Illinois Steel Company, the business amounting to 50,000 tons or more, and orders for 30,000 tons additional are expected from the shipbuilding interests within a short time. The general demand for Plates by boiler shops and other consumers is fairly heavy and leading local Plate mills are filled up on practically all sizes for the next four to six months. We are advised that the Eastern Plate mills are not quite so busy, but can make reasonably prompt deliveries. The differential of \$2 a ton on prices of narrow Plates, ranging from 6¼ to 14 inches wide, is gradually being eliminated, nearly all tonnage now being on the basis of 1.60c., irrespective of sizes. Prices are firm, and we quote: Tank Plates, ¼ inch thick, 6¼ to 14 inches wide, 1.50c., base; over 14 inches wide and up to 100 inches in width, 1.60c., base, at mills, Pittsburgh. Extras over the above prices are as follows:

|   | Extra per<br>100 pounds. |
|---|--------------------------|
| Gauges lighter than ¼-inch to and including 3-16-inch Plates on thin edges..... | \$0.10                   |
| Gauges No. 7 and No. 8.....   | .15                      |
| Gauge No. 9.....  | .25                      |
| Plates over 100 to 110 inches.....  | .05                      |

|  |      |
|--|------|
| Plates over 110 to 115 inches.....   | .10  |
| Plates over 115 to 120 inches.....   | .15  |
| Plates over 120 to 125 inches.....   | .25  |
| Plates over 125 to 130 inches.....   | .50  |
| Plates over 130 inches.....  | 1.00 |
| All sketches (excepting straight taper Plates varying not more than 4 inches in width at ends, narrowest end being not less than 30 inches)... | .10  |
| Complete Circles.....  | .20  |
| Boiler and Flange Steel Plates.....  | .10  |
| Marine, "A. B. M. A." and ordinary Fire Box Steel Plates.....  | .20  |
| Still Bottom Steel.....  | .30  |
| Locomotive Fire Box Steel.....   | .50  |

Shell Grade of Steel is abandoned.

**TERMS.**—Net cash 30 days. For anticipated payments a maximum discount may be allowed at the rate of 6 per cent. per annum and for a longer time than 30 days interest shall be charged at the same rate per annum. Invoices paid within ten days from date thereof, discount of ½ of 1 per cent. is allowable. Pacific Coast base, 1.40c. f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes 14 inches wide down to 6 inches of Tank, Ship or Bridge quality.

**Structural Material.**—The Union National Bank of this city has plans out for the building of a 20-story office structure at the corner of Fourth avenue and Wood street, in this city. The building will take upward of 3200 tons of Steel. The American Bridge Company has closed a contract with the Birmingham & Atlantic Railroad for about 1200 tons of Steel for bridge work. Bids for the Ironton Bridge at Ironton, Ohio, have been sent in and this job, which will take about 12,000 tons, will likely be placed within a short time. A great deal of small work is being placed and the leading Structural interests are filled up with work for the next four to six months or longer. Deliveries from the mills are still very unsatisfactory, especially on Open Hearth material. The mills rolled 24-inch Beams in August and these rolls will not be put in again before November, giving some idea of the delay in getting deliveries on the larger sizes. Prices are firm and we quote: Beams and Channels, up to 15-inch, 1.70c.; over 15-inch, 1.80c.; Angles, 3 x 2 x ¼ inch thick up to 6 x 6 inches, 1.70c.; Angles, 8 x 8 and 7 x 3½ inches, 1.80c.; Zees, 3-inch and larger, 1.70c.; Tees, 3-inch and larger, 1.75c. Under the Steel Bar card Angles, Channels and Tees under 3-inch are 1.60c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

**Sheets.**—Some mills report slight betterment in demand for Sheets, but, generally speaking, the Sheet trade is in rather unsatisfactory condition, prices being very low, based on the cost of Sheet Bars, while demand does not begin to take the output of the mills. We quote: Black Sheets, box annealed, one pass through cold rolls, No. 24 gauge, 2.05c. to 2.10c.; No. 26, 2.15c. to 2.20c.; No. 27, 2.20c. to 2.25c.; No. 28, 2.25c. to 2.30c. Galvanized Sheets are quite firm and we quote: Nos. 22 and 24, 2.75c. to 2.80c.; Nos. 25 and 26, 2.95c. to 3c.; No. 27, 3.10c. to 3.15c.; No. 28, 3.30c. to 3.35c. We quote No. 28 Gauge Painted Roofing Sheets at \$1.65 to \$1.75 per square, and Galvanized Roofing Sheets, No. 28 gauge, at \$2.85 to \$2.95 for 2½-inch corrugation. Jobbers charge the usual advances over above prices for small lots from store.

**Iron and Steel Bars.**—Tonnage in Steel Bars is very heavy and the mills are three to four months or longer behind in delivery. The demand for Iron Bars is quite active, the mills having a good deal of work ahead of them. We quote Refined Iron Bars at 1.70c., Youngstown, or 1.74¼c., Pittsburgh. We quote Steel Bars at 1.50c., base, half extras, for carloads and larger lots.

**Hoops and Bands.**—The four leading mills that make Hoops and Bands are now filled up with tonnage for several months. We quote Steel Hoops at 1.75c. and Bands to be used for cooperage purposes at 1.75c., the latter carrying full Hoop and Band extras. Bands for other than cooperage purposes are 1.50c., base, half extras as per Standard Steel card. Above prices are for carload lots, f.o.b. Pittsburgh, plus full tariff Rail rate to point of delivery.

**Tin Plate.**—The Tin Plate trade continues rather dull and does not give promise of early improvement. We quote Tin Plate \$3.50 to \$3.55, base, terms 30 days, less 2 per cent. off for cash in 10 days. These prices are sometimes shaded 15c. a box or more by outside mills.

**Merchant Steel.**—The new tonnage being placed is quite heavy and with season contracts placed some time ago the mills have a great deal of work ahead of them. The Cambria Steel Company has practically retired from the market as a seller, being reported as practically filled up to July of next year. Prices continue firm and for current business are as follows: Flat Sleigh Shoe, 1.50c. to 1.55c.; Toe Calk Steel, 2c. to 2.05c.; Smooth Finished Tire, 1.65c. to 1.70c.; Cutter Shoes, 2.15c. to 2.20c.; Railway Spring Steel, 1.65c. to 1.70c.; Crucible Tool Steel, 5½c. to 8c. for ordinary grades; special grades, 12c. and upward. Shafting is in fair demand, discounts being 50 per cent. off in carloads and 45 per cent. in less than carloads.

**Railroad Spikes.**—The demand continues quite active, the three local works that make Railroad Spikes being well filled up for the next several months. We quote \$1.65 to \$1.70 per 100 lbs., maker's mill.

**Spelter.**—The market is more active and prices are firmer. We quote prime grades of Western Spelter at 5.65c. to 5.70c., St. Louis, equal to 5.75½c. and 5.82½c., Pittsburgh.

**Merchant Pipe.**—The tonnage in Merchant sizes placed so far this month has not been quite as large as in August, but is fairly satisfactory. The Cornplanter Refining Company, Warren, Pa., which owns the Cherokee lease in Indian Territory, will build a large oil refinery at St. Louis and will build an Oil line from Bartlesville, I. T., to St. Louis, which will require 340 miles of 6 and 8 inch line Pipe. It is stated positively that this line will be built and that prices on the Pipe will be asked for in a short time. Prices of Merchant Pipe to consumers are on the basis of 79 off and to jobbers 80 off the official list of discounts. These official discounts, which are shaded 5 points, or 80 per cent. off, are as follows:

|   | Steel.    |           | Iron.     |           |
|---|-----------|-----------|-----------|-----------|
|   | Black.    | Galv.     | Black.    | Galv.     |
|   | Per cent. | Per cent. | Per cent. | Per cent. |
| ½ and ¾ inch.....                           | 67        | 51        | 65        | 49        |
| ¾ and 1 inch.....                           | 71        | 59        | 69        | 57        |
| 1 to 6 inches.....                          | 75        | 65        | 73½       | 63½       |
| 7 to 12 inches.....                         | 70        | 55        | 68½       | 53        |
| Extra strong, plain ends, ½ to ¾ inch..     | 60        | 48        | 58        | 46        |
| ¾ to 4 inches.....                          | 67        | 55        | 65        | 53        |
| 4½ to 8 inches.....                         | 63        | 51        | 61        | 49        |
| Double extra strong, plain ends, ½ to 8 in. | 56        | 45        | 54        | 43        |

**Boiler Tubes.**—The demand continues very active, the mills being two to three months behind in delivery. Official prices are well maintained and are as follows:

|                      | Iron. | Steel. |
|----------------------|-------|--------|
| 1 to 1½ inches.....  | 41    | 44     |
| 1½ to 2¼ inches..... | 41    | 56     |
| 2½ inches.....       | 46    | 58     |
| 2½ to 5 inches.....  | 53    | 64     |
| 6 to 13 inches.....  | 41    | 56     |

**Coke.**—The output of Coke in the Connellsville region this year has averaged more than 1,000,000 tons a month, and it is estimated that the Upper and Lower Connellsville regions will turn out very close to 15,000,000 tons of Coke this year, much the heaviest output of any one year in the history of the Connellsville trade. Out of about 24,000 ovens in the Connellsville region the H. C. Frick Coke Company owns 11,413, of which 10,326 were active last week. Identified interests of the Steel Corporation own 3263 ovens in the Connellsville district proper, all of which are making Coke, being operated by the Frick Coke Company. The next largest producer is the W. J. Rainey Estate, which has 2999 ovens, of which 679 were active last week. The Brown and Cochran interests have 687 ovens, all of which are active, while the Hecla Coke Company, owned by the Frick Coke Company, has 1072 ovens, of which 256 are idle. Both Furnace and Foundry Coke for prompt shipment is scarce, and for strictly Connellsville Furnace Coke for shipment over balance of this year \$2.35 a ton at oven is quoted. Strictly Connellsville 72-hour Foundry Coke for delivery this year is held at \$2.50 a ton at oven and higher prices are asked for next year. Out of a total of 30,289 ovens in the Upper and Lower Connellsville regions only 2455 were idle last week. It is confidently predicted that both Furnace and Foundry Coke will sell at much higher prices next year than ruled during this year.

**Iron and Steel Scrap.**—We note considerable activity in the Scrap market, with the tendency on the part of dealers to hold their Scrap for higher prices, which seem probable before long. Heavy Melting Scrap is held at \$16 to \$16.50 and is scarce at these prices. For other grades dealers quote as follows: No. 1 Wrought Scrap, \$16; Cast Iron Borings, \$8.50; Bundled Sheet Scrap, \$13.75 to \$14; Cast Steel Scrap, \$15; Machinery Cast Scrap, \$14.50; Old Steel Rails, short pieces, \$15.50; long pieces, \$16, all in gross tons, f.o.b. Pittsburgh.

## Cleveland.

CLEVELAND, OHIO, September 26, 1905.

**Iron Ore.**—Although it is early for the discussion of Ore prices for next year the heavy buying of Pig Iron for delivery through the first quarter and in some cases the first half of 1906 and the advance in prices have already brought out the intimation that Ore prices are likely to be marked up. The basis suggested is that which prevailed during 1902. Indications are that the movement of Ore down the lakes during September will be above 4,000,000 tons, so that the movement of last year will be exceeded. The car shortage is beginning to pinch a little and this is checking shipments, but the lake tonnage continues abundant and there is no hesitation in that quarter. Rates of carriage remain unchanged at 75c. from Duluth to Ohio ports, 70c. from Marquette and 60c. from Escanaba.

**Pig Iron.**—Buyers have come to be somewhat feverish in their desire for Iron. The period of uncertainty as to prices has passed and at the same time some signs appear of

nervousness on the part of buyers, while sellers are stiff in their views. This situation was first noted in Bessemer, Basic and Malleable. The further purchase by the Steel Corporation of Bessemer Iron and the inquiries from a number of the larger Steel makers stiffened the Bessemer market, putting the price to \$15 at Valley furnace. It then began to develop that the Iron unsold was not sufficient for the apparent needs of the buyers, based on the volume of inquiries. Many of the consumers tried to cover their needs not only for the remainder of this year, but for the first quarter and first half of next year. In one instance Iron was sold as high as \$15.50, while purchases for first quarter delivery at \$15.25 are common, and some contracts have been closed at \$15.50 for delivery through the remainder of this year and the first half of next. At present \$15, in the Valley, is bottom for Steel making Irons. In the foundry trade some furnaces wanted to fill up and accepted \$14.50 for No. 2, in the Valley. They now make the announcement that they are holding for \$15, in the Valley, for No. 2. In the meantime some Iron has been sold at \$14.75, although at present all the Valley furnaces represented here are holding for \$15, in the Valley, for No. 2, and some of them have even quoted \$15.50 at the furnace. The inquiries are heavy for first quarter delivery and fair for first half. The Coke situation is growing constantly stronger and some furnace and foundry men are concerned. The supply is noticeably short, with prices advancing rapidly. The best grades of 72-hour Foundry Coke are now selling at \$3 a ton at the oven and Furnace Coke is selling at \$2.50. Other grades have sold for less.

**Finished Iron and Steel.**—The stringency noted recently in the Structural trade continues and is spreading to the Rail and Plate trades. A shortage in Plates has been threatened for some time, but has become acute only during the past ten days. Premiums are now being talked in the trade, ranging from \$2 to \$3 a ton for quick shipment. Meantime buying for delivery during the remainder of the year is hampered by the congested condition of the mills and some buyers are seeking to cover into next year. This has brought talk of an advance in Plates to the same level as Structural Steel. The scarcity of Standard Rails for the deliveries wanted continues to be one of the notable features of the market, the situation being especially emphasized in this territory, where some new construction work has been planned. The offer of premiums has had but little effect in relieving the situation, since the Rail mills generally disregard premium offers. Buying in this territory for advanced delivery has continued fairly good. The Structural situation has not been relieved and conditions still point to an extreme shortage of material and a growing demand for it, construction work in this territory assuming new proportions with the growth of general business. The placing of several new boats with one of the lake shipyards during the past week increases the demand from that quarter. The price for Shapes holds in the main at 1.70c. at mill, Pittsburgh, although for spot shipment the mill or dealer having material to sell is about able to dictate prices. On such lots the market runs from 2.25c. to 2.50c. Some special concessions which had been made to get Pipe business have been withdrawn. Prices are steadier and the demand stronger. Price cutting in Sheets is disappearing and business is fairly good on the old basis, out of stock, of 2.05c. for No. 10 Blue Annealed, 2.55c. for No. 28, one pass cold rolled, and 3.55c. for No. 28 Galvanized. Bar Iron is stronger on a limited supply, the price holding generally at 1.70c. at the mill. Bar Iron business is fair, although most of the consumers have covered. Specifications against old contracts are of full volume. Billets continue very scarce and anything available is quoted at \$26 to \$27 in the Pittsburgh district.

**Old Material.**—The Scrap market is stronger. Dealers are making fair sales and the volume shows a tendency to increase. Prices have not changed during the week, the following representing dealers' quotations to the mills, gross tons: Old Steel Rails, \$15 to \$15.50; Old Iron Rails, \$20 to \$21; Old Car Wheels, \$16; Heavy Melting Steel, \$15 to \$15.50. Net tons: Cast Borings, \$8.50 to \$9; No. 1 Busheling, \$14; No. 1 Railroad Wrought, \$16; Iron Car Axles, \$21 to \$22; No. 1 Cast, \$14; Stove Plate, \$10.50 to \$11; Iron and Steel Turnings and Drillings, \$10 to \$10.50.

## Cincinnati.

FIFTH AND MAIN STS., Sept. 27, 1905.—(By Telegraph.)

**Pig Iron.**—The market is strong and firm and throughout the entire week has been very active. Selling agencies report heavier tonnage along the lines of Basic, Malleable, Foundry and Forge Irons sold during this time throughout this territory than at any similar period in the history of the trade. This movement was not confined to any particular class of consumers, but all kinds of industries were represented—stove makers, implement makers, machine tool builders, car wheel manufacturers and general foundry trade. Prices have stiffened somewhat and the ruling quotation on Southern No. 2 is \$12, Birmingham, basis, ranging upward to \$12.50

There is said to be considerable resale spot Iron offering below \$12, which fact is probably the weakest point in the market. Quite a heavy tonnage of Gray Forge was sold during the week, the ruling quotation being \$10.50. The lower grades are still plentiful, but have been considerably decreased during the week. Northern Irons have also advanced in price, No. 2 being quoted at \$14.50, furnace, and very strong. The feeling seems to prevail that the bulk of the buying for the six months is over, and, while great strength is manifest, there is less activity than there was several days since. There are several inquiries still open, one from a southern Ohio concern for 1500 tons and one from a central Ohio melter for 1000 tons of Southern for first-quarter delivery, as well as a number for less tonnage. Sales made during the week are estimated to exceed 150,000 tons, of which amount one of the leading Cast Iron Pipe concerns is said to have secured from 60,000 to 70,000 tons. A large concern in Michigan bought 5000 tons of Northern for delivery remainder of this year. A plant in central Ohio bought 5000 tons, delivery to be made within the next six months. These, taken in connection with numerous orders of variable tonnage, go to make the grand total of the week's sales. Freight rates from Hanging Rock district to Cincinnati, \$1.15, and from Birmingham, \$2.75. We quote, f.o.b. Cincinnati, as follows:

|                                |                    |
|--------------------------------|--------------------|
| Southern Coke, No. 1.....      | \$15.25 to \$15.75 |
| Southern Coke, No. 2.....      | 14.75 to 15.25     |
| Southern Coke, No. 3.....      | 14.25 to 14.75     |
| Southern Coke, No. 4.....      | 13.75 to 14.25     |
| Southern Coke, No. 1 Soft..... | 15.25 to 15.75     |
| Southern Coke, No. 2 Soft..... | 14.75 to 15.25     |
| Southern Coke, Gray Forge..... | 13.25 to 13.75     |
| Southern Coke, Mottled.....    | 13.00 to 13.50     |
| Ohio Silvery, No. 1.....       | 19.15 to 19.65     |
| Lake Superior Coke, No. 1..... | 16.15 to 16.65     |
| Lake Superior Coke, No. 2..... | 15.65 to 16.15     |
| Lake Superior Coke, No. 3..... | 15.15 to 15.65     |

*Our Wheel and Malleable Irons.*

|                                       |                    |
|---------------------------------------|--------------------|
| Standard Southern Car Wheel.....      | \$18.75 to \$19.25 |
| Lake Superior Car Wheel and Malleable | 18.25 to 18.75     |

**Coke.**—The market is very strong and active, the demand exceeding supply. In addition to this there is said to be a shortage of cars and deliveries are being made in a very unsatisfactory manner. Quotations fluctuate to a certain extent, the best grades of Connellsville and Wise County, Va., Foundry bringing \$2.75 for spot delivery and \$3 on contracts into next year. Furnace grades are selling at \$2.25, f.o.b. ovens.

**Finished Iron and Steel.**—Trade maintains an active pace and there appears to be no decrease in the way of new business. Plate and Shapes are holding strong, with no change in Structural lines generally. Prices are said to be unchanged. We quote, f.o.b. Cincinnati, as follows: Iron Bars, in carload lots, 1.65c., with half extras; the same in smaller lots, 1.90c., with full extras; Steel Bars, in carload lots, 1.63c., with half extras; the same in small lots, 1.85c., with full extras; Base Angles, 1.73c., in carload lots; Beams and Channels, in carload lots, 1.83c.; Plates,  $\frac{1}{4}$ -inch and heavier, 1.73c., in carload lots; in smaller lots, 1.90c.; Sheets, 16-gauge, in carload lots, 2.15c.; in smaller lots, 2.70c.; 14-gauge, in carload lots, 2.05c.; in smaller lots, 2.60c.; Steel Tire,  $\frac{1}{4}$  x 3-16 and heavier, 1.83c., in carload lots.

**Old Material.**—There is no question that dealers have done considerable business during the past week. Demand is said to be on the increase, with more stock offering. We quote dealers' prices, f.o.b. Cincinnati, as follows: No. 1 Railroad Wrought Scrap, \$16 to \$16.50 per net ton; No. 1 Cast Scrap, \$13 to \$13.50 per net ton; Iron Rails, \$19 to \$20 per gross ton; Steel Rails, rolling mill lengths, \$14 to \$14.50 per gross ton; Relaying Rails, 56-lb. and upward, \$23.50 to \$24 per gross ton; Iron Axles, \$21.50 to \$22 per net ton; Car Wheels, \$15.50 to \$16 per gross ton; Heavy Melting Scrap, \$14 to \$14.50 per gross ton.

### The Street Railway Convention.

Delegates from all parts of the United States, from Canada and from Mexico are in attendance in Philadelphia this week at the annual convention of the American Street Railway Association and its allied organizations—the American Railway Mechanical and Electrical Association, the Street Railway Accountants' Association and the American Association of Street Railway Claim Agents—together with the annual meeting and appliance exhibition of the Manufacturers' Association of the American Street Railway Association, held in the south pavilion of the Philadelphia Museum.

The American Railway Mechanical and Electrical Association opened the convention on Monday in the convention hall of the Museum, the delegates and their friends being welcomed to the city by Mayor John Weaver, to which W. Caryl Ely, president of the American Street Railway Association, replied. Routine business was transacted during the remainder of the session,

which was continued during Tuesday. Papers were also read on the following subjects: "Power Distribution," by C. H. Hill, Boston, Mass.; "The Power Station Load Factor as a Factor in the Cost of Operation," by L. P. Crecelius, St. Louis, Mo.; "The Track Brake," by F. F. Bodler, San Francisco, Cal., and "The Power House," by F. N. Bushnell, Providence, R. I., while various committees reported on the following subjects: "Controlling Apparatus," by Chairman J. S. Doyle, New York, N. Y.; "Welding of Rail Joints," by Chairman F. G. Simmons, Milwaukee, Wis., and "Maintenance and Inspection of Electrical Equipment," by Chairman Wm. Pestell, New York. The election of officers for the ensuing term followed and resulted in the choice of the following list:

President, H. H. Adams, superintendent of motive power, United Railways & Electric Company, Baltimore, Md.; first vice-president, F. G. Simmons, superintendent of construction and maintenance of way, Milwaukee Electric Railway & Light Company, Milwaukee, Wis.; second vice-president, J. S. Doyle, superintendent of maintenance of way, Interurban Rapid Transit Company, New York; third vice-president, Paul Winsor, chief engineer, Boston Elevated Railway, Boston, Mass.; secretary and treasurer, S. W. Mower, Detroit United Railways, Detroit, Mich. Executive Committee: W. S. Twinning, chief engineer, Philadelphia Rapid Transit Company, Philadelphia; F. N. Bushnell, chief engineer, Rhode Island Electric Company, Providence, R. I.; W. B. Reed, engineer of maintenance of way, New York City Railways, New York; A. D. Campbell, engineer of maintenance of way, Seattle Electric Company, Seattle, Wash.

The American Association of Street Railway Claim Agents held its meeting on Tuesday morning, in room 1048 Land Title & Trust Company, when matters of particular interest to that association were discussed.

The American Railway Association opened its convention on Wednesday, to continue during Thursday. Papers were to be read on "Notes on the Design of Large Gas Engines, with Special Reference to Railway Work," by Arthur West; "The Application of Gas Power to Electric Railway Work," by J. R. Bibbins, and "The Single Phase Railway System," by Chas. F. Scott of the Westinghouse Electric & Mfg. Company. The Street Railway Accountants will meet afterward.

The local Reception Committee, of which James F. Rawle is chairman, held a reception in the ball room of the Bellevue-Stratford Hotel, Tuesday evening, and the annual banquet will be held at the same place on Thursday night, Wednesday and Friday nights being devoted to a theater party and vaudeville entertainment, respectively. The exhibition of railway appliances, under the auspices of the American Street Railway Manufacturers' Association, was said to be the best that the association has even held. Thomas K. Bell, chief engineer of Wm. Wharton, Jr., & Co., Incorporated, Philadelphia, Pa., served as director of exhibits, and nearly 200 exhibits occupying varying spaces were in position at the opening of the convention, with displays and working exhibits, including among others, the General Electric Company, Schenectady, N. Y.; Wm. Wharton, Jr., & Co., Incorporated, Philadelphia, Pa.; E. W. Bliss Company, Brooklyn, N. Y.; J. G. Brill Company, Philadelphia; Jones & Laughlin Steel Company, Pittsburgh, Pa.; Yale & Towne Mfg. Company, New York; Warren Webster Company, Camden, N. J.; Cyrus Borgner, Philadelphia; Goldschmidt Thermit Company, New York; Merchant & Evans Company, Philadelphia; Westinghouse Companies, Pittsburgh, Pa.; Standard Steel Company, Steelton, Pa.; R. D. Nuttal & Co., Pittsburgh, Pa.; Merritt & Co., Philadelphia; Manning, Maxwell & Moore, New York; H. W. Johns-Manville Company, New York; International Sprinkler Company, Philadelphia; American Ferroflex Company, Philadelphia; John Simmons Company, New York; Lorain Steel Company, Lorain, Ohio; Chicago Pneumatic Tool Company, Chicago, Ill., and the Harrison Safety Boiler Works, Philadelphia.

It is stated in the *Chattanooga Tradesman* that the foundries in Chattanooga melt about 125,000 tons of pig iron a year. This is said to be a larger consumption of foundry pig iron than in any other Southern city.

## New York.

NEW YORK, September 27, 1905.

**Pig Iron.**—The activity reported last week has continued on a broadening scale, and while the past two days have not been so prolific in sales, good inquiries are still pending, including, in Northern Foundry Iron, one of 2500 tons for an important interest. Southern sellers have disposed of most of the Iron they will have for shipment this year and are temporarily out of the market. The heavy recent business has been done at \$12 for No. 2 Foundry at Birmingham, some deliveries running into and through the first quarter of 1906. While large sellers are not quoting at present \$12.50 is the nominal market for No. 2. Eastern furnaces have advanced prices from 50c. to 75c. a ton on active buying. The buying in Basic Iron continued strong the past week and 55,000 to 60,000 tons were taken. The market is very firm at \$16, delivered. We quote Northern Iron, at tidewater, \$17.50 to \$17.75 for No. 1 Foundry, \$16.75 to \$17.25 for No. 2 Foundry and \$16.25 to \$16.50 for No. 2 Plain. Southern Iron has sold in the week at \$15.75 to \$16 for No. 2, New York harbor.

**Steel Rails.**—The past week has added a number of round lots to the heavy bookings already reported, nearly all the railroads seeking some deliveries early in the coming year. With the business to be carried over from 1905 into 1906 some maneuvering by the mills will be necessary to accommodate the demands of early spring work. The Southern mill, with a capacity of about 15,000 tons a month, is filled up to the last two months of next year. Among orders of the past week are 10,000 tons from the Central of Georgia, 8000 tons from the Des Moines & Fort Dodge, 30,000 tons from the Northern Pacific, 40,000 tons from the Rock Island and 25,000 tons additional from the Norfolk & Western.

**Cast Iron Pipe.**—Business keeps up wonderfully so late in the season. The foundries are all well employed and orders are being placed for deliveries considerably in the future. No very large orders have recently come out, the demand running to moderate quantities. Carload lots are firmly held on the basis of \$27.50 per net ton for 6-inch, at tidewater.

**Finished Iron and Steel.**—Contracting for fabricated work in the Structural line has been light during the past week. Bids are in on about 30,000 tons of railroad work and 15,000 tons more will be bid on before the week ends. Buyers, however, are taking time to consider. The inability of manufacturers to make prompt deliveries is a factor in the situation which is doubtless of great influence in delaying the placing of contracts. Next month quite a number of important propositions are expected to take shape. In the large cities Steel frame construction is very quiet, although residential building is extremely active. The Plate trade is in very satisfactory shape. Contracts are being placed freely for deliveries running during the remainder of the year. The Eastern mills are still in position to make early shipments on orders now being received, but their books are filling up rapidly. The demand for Bars is very heavy. Among the contracts placed during the week was one for 1000 tons of Twisted Bars for concrete work. Bar Iron is in particularly good demand and premiums are easily secured for prompt shipment. Quotations at tidewater for shipment from mills are as follows: Beams, Channels, Angles and Zees, 1.89½¢. to 1.99½¢.; Tees, 1.94½¢. to 2.04½¢.; Bulbs, Angles and Deck Beams, 1.99½¢. to 2.09½¢.; Sheared Tank Plates, 1.74½¢. to 1.84½¢.; Flange Plates, 1.84½¢. to 1.94½¢.; Marine Plates, 1.94½¢. to 2.04½¢.; Fire Box Plates, 2.04½¢. to 2.60¢., according to specifications; Refined Bar Iron, 1.69½¢. to 1.79½¢.; Soft Steel Bars, 1.64½¢. to 1.74½¢.

**Old Material.**—The market is very strong, especially on Heavy Cast Scrap and Stove Plate. The demand for Steel Scrap is on the mend, some of the Steel works buying a little more freely and inquiries increasing. Sales of about 2000 tons have been made from this territory for delivery in eastern Pennsylvania. Holders continue to ask a price which is a little above what most of the works are offering, but are confident that they will be able to maintain their position in view of the very heavy demand for all kinds of finished products. A strong demand is noted for Railroad Wrought and Old Wrought Pipe. Very little Pipe is now to be had in this territory and it appears to be about the scarcest article on the list. As the demand for Bar Iron is extremely heavy, it is believed that the rolling mills must come into the market much more freely in the near future. Cast Borings are in quite good supply, owing to the fact that all kinds of manufacturing establishments are now unusually busy and are therefore making exceptionally large quantities of this class of material. Among the sales of the week were 1200 tons of Relaying Rails, 1000 tons of Heavy Cast Scrap, 1000 tons of Stove Plate and 500 tons each of Borings and Turnings. Quotations for New York and vicinity are approximately as follows, in gross tons:

|   |                    |
|---|--------------------|
| Old Iron Rails.....                     | \$19.00 to \$20.00 |
| Relaying Steel Rails.....               | 23.50 to 24.50     |
| Old Steel Rails, rerolling lengths..... | 14.75 to 15.75     |
| Old Steel Rails, short pieces.....      | 14.50 to 15.00     |
| Heavy Melting Steel Scrap.....          | 14.50 to 15.00     |
| Old Iron Car Axles.....                 | 21.00 to 22.00     |
| Old Steel Car Axles.....                | 18.50 to 19.50     |
| No. 1 Railroad Wrought.....             | 19.00 to 19.50     |
| Iron Track Scrap.....                   | 16.50 to 17.50     |
| No. 1 Yard Wrought.....                 | 16.75 to 17.75     |
| Wrought Pipe.....                       | 14.00 to 15.00     |
| Ordinary Light Iron.....                | 10.00 to 11.00     |
| Cast Borings.....                       | 8.50 to 9.50       |
| Wrought Turnings.....                   | 12.00 to 13.00     |
| Old Car Wheels.....                     | 16.50 to 17.50     |
| No. 1 Machinery Cast.....               | 15.00 to 16.00     |
| Stove Plate.....                        | 12.25 to 13.25     |
| Railroad Malleable Cast.....            | 14.75 to 15.75     |

## Metal Market.

NEW YORK, September 27, 1905.

**Pig Tin.**—The market has been without any features of special interest during the week. The lowest price for the week was on the 22d, when spot Tin was sold at 31.75c. Tuesday the high price of 32c. was reached, which was perhaps due to manipulative movements intended to influence the London market so that a high price could be obtained at the periodic Banca sale. This sale occurred to-day, going at the comparatively high figure of 32.60c., c.i.f. New York. The amount of metal that has arrived in this country so far this month, which aggregates 3354 tons, is thought by shrewd observers to be in excess of the consumption, particularly as 60 per cent. of the leading interest's Tin Plate mills are idle. The market is 32.10c. to-day for spot. The London cable is likewise slightly higher, at £147 for spot and £145 12s. 6d. for futures.

**Copper.**—The chief interest in the Copper market this week is the reported squeeze in Standard Warrants at London, the price of spot having advanced from £69. 2s. 6d. to £71, while futures advanced from £69 2s. 6d. last Wednesday to £70 2s. 6d. to-day. This has had a sentimental effect on the American market and prices are stiffer, although business is very dull. A fair sized lot of Lake Copper was sold this week at 16.37½¢., for ten-day shipments. Strictly spot stocks would command 16.50¢., while for deliveries extending over a longer period concessions from this price would probably be made. The quotation on the New York Metal Exchange was advanced yesterday to 16.12½¢. to 16.37½¢. The export movement throws no light on the high prices ruling for the metal, the shipments so far this month aggregating but 16,298 tons.

**Spelter.**—The price has advanced and the New York market is firm at 5.95c. to 6.05c. In St. Louis the market is also firm, and to-day's quotations are from 5.80c. to 5.82½¢. Zinc ore has shown considerably more activity, the price having advanced from \$1 to \$2 per ton over last week. In London the market has likewise advanced, and now rules firm at £27 5s.

**Pig Lead.**—The market is quiet, with the price in New York unchanged at 4.85c. to 4.90c. The American Smelting & Refining Company continues to quote shipment Lead in 50-ton lots at 4.85c. In St. Louis the market has been steady, closing at 4.75c. to 4.77½¢. The supply, although large, is not excessive and buyers can easily satisfy their wants. The receipts at St. Louis since January 1 aggregate 1,501,985 pigs, as against 1,595,750 pigs during the corresponding period last year. Shipments since January 1 aggregate 1,016,995 pigs, as against 965,910 pigs during the corresponding period last year. The London market has steadily advanced, closing to-day at £14 2s. 6d.

**Antimony.**—The dull and unsatisfactory condition of trade in this metal continues, but prices are considerably lower. Hallett's is quoted at 13c. to 13.50c.; other brands at 11.50c. to 12.25c.

**Quicksilver.**—Is unchanged at \$40.50 per flask of 75 lbs. in 100-flask lots. In San Francisco domestic orders are held at \$39, while export business can be done at \$38. The London market is steady at £7 2s. 6d.

**Nickel.**—Large lots are obtainable at 40c. to 45c. and less than ton lots at 50c. to 60c. per lb.

**Tin Plate.**—The official quotations are unchanged at \$3.74 a box for 100-lb. IC Coke Plates, f.o.b. New York, and \$3.55, f.o.b. Pittsburgh, but independent producers are shading these prices to the extent of 15c. to 25c. a box. It is interesting to observe that, although Tin Bars in Pittsburgh are \$5.50 per ton higher than last year and Pig Tin in New York is 4½¢. per lb. higher than a year ago, the price of Tin Plate from second hands is but 10c. per box higher than last year. It may be that the present situation has been largely brought about by an oversupply which the manufacturers accumulated in anticipation of unfavorable labor controversies. In the canning trade, too, the manufacturers of cans purchased heavily at the first of the year and have been reselling Plates as this year's pack has not been up to anticipation. Plates in Swansea are 1½ pence lower, at 11 shillings 9 pence.

### Central Electric Light and Power Stations.

The Bureau of the Census has just published a report on central electric light and power stations for the year ending June 30, 1902, prepared under the supervision of W. M. Steuart, chief statistician for manufactures. In addition to the text, which was prepared by T. C. Martin of New York City, expert special agent, there are elaborate tables and an interesting series of illustrations.

The chapters of text discuss, respectively, the scope and method of the investigation, financial operations, employees, salaries and wages, physical equipment, output of stations, franchises and the history and development of electric lighting.

For convenience in study the various electric stations have been divided into two grand classes: Those operated by individuals or corporations, and those operated under municipal control. Each of these classes is subdivided into those doing a purely electric business and those operated in connection with other industries. The latter are designated composite stations. Further subdivisions have been made, one being based upon the population of the place in which the station is located and the other upon the horse-power capacity of the generating apparatus of the station.

The growth of this industry is shown by the following figures: From eight stations beginning operation in 1881 the number rose to 100 in 1886, to 208 in 1889 and to 247 in 1892. During the following years of depression the number of new stations fell; but in 1895, though a time of financial stringency, it again rose to 239. In 1898 it reached 277, or more than the number beginning operation in the entire period from 1881 to 1886, inclusive. The number for 1901 was 250 and for five months of 1902 it was 146. In the 20 years from 1881 to 1901, inclusive, an average of 165 private and municipal stations have begun operation each year. The spread of the agitation for municipal ownership of public service enterprises is illustrated in a somewhat striking manner. Of the 815 municipal stations enumerated, only 68 had been installed up to 1889. In that year 40 were introduced, and in 1895 the number of new stations reached 73, increasing in 1898 to 82. The returns for 1902 indicate that the ratio was fully maintained in the census year.

In 1902 there were in the United States 3620 central electric stations, with a cost of construction and equipment of \$504,740,352. Employed were 6996 salaried officials and clerks with salaries amounting to \$5,663,580; and 23,330 wage earners with wages amounting to \$14,983,112. The gross income was \$85,700,605, comprising \$84,186,605 from sale of current and \$1,514,000 from other sources. The total expenses were \$68,081,375. The total output of stations for the year, in kilowatt hours, was 2,507,051,115. The number of arc lamps was 385,698 and of incandescent lamps 18,194,044.

The largest number of stations was in Illinois, followed by Pennsylvania, New York, Ohio, Michigan, Indiana, Iowa and Wisconsin in the order named. No other State reached the 150 mark. The New England States were well supplied with stations. Massachusetts reported the largest number, then came Maine, Vermont, New Hampshire and Connecticut. Among the Southern States Texas led, with Kentucky, Tennessee and Georgia following. Of the Western States, California reported the largest number of stations, Colorado, Washington, Oregon and Montana being next in order. Of the 1892 places reported at the Twelfth Census as having a population of 2500 and over, 1511 had one or more central electric lighting stations. Of the places with a smaller population, 1960 had similar stations.

A number of companies supply areas of many square miles. The extreme limit of such work at the time of this report was the long distance power transmission on the Pacific coast, where current from the Sierras was delivered for general consumption in San Francisco and Sausalito, and was also distributed from the same plants over lines which ramify into half the counties of the State of California. There are at least a thousand polyphase power transmission plants, with lines frequently 15 or 20 miles long, in many cases 40 or 50 miles, often

60 or 90 miles, and sometimes even 150 or 200 miles. These are particularly typical of the far Western States, but are by no means concentrated there, being scattered all over the Union.

Physical equipment is considered under the three heads—power and generating equipment, line construction and service line equipment. The power plant equipment showed 5930 steam engines, with 1,379,941 horse-power, and 1390 water wheels with 438,472 horse-power, and the generating plant equipment, 3823 direct current constant voltage dynamos with 442,446 horse-power, 3539 direct current constant amperage dynamos with 195,531 horse-power, and 5122 alternating and polyphase current dynamos with 987,003 horse-power. The line construction had 107,263 miles of mains and 17,880 miles of feeders. For the service line equipment meters, lamps and motors are the important items. There were 582,689 meters; 575,004 of these were mechanical and 7685 chemical. The aggregate of arc lamps of all classes was 385,698. In addition to these the street railways operating electric lighting stations reported 33,863 arcs, making the total for the United States 419,561. The average output of current per day for all stations was 6,960,783 kilowatt hours, making a total for the year of 2,507,051,115.

### Iron and Industrial Stocks.

NEW YORK, September 27, 1905.

The stock market has been very narrow during the whole of the past week. Investment and speculative interests are conservative, awaiting the outcome of the movement of money. The transactions have been limited and fluctuations have been small. The market, however, shows decided strength. Last transactions in active stocks up to 1.30 p.m. to-day are reported at the following prices: Can common 11½, preferred 71½; Car & Foundry common 36, preferred 99½; Locomotive common 53, preferred 113¼; Steel Foundries common 9, preferred 38½; Colorado Fuel 44½; Pressed Steel common 44½, preferred 95¼; Railway Spring common 39½, preferred 101¼; Republic common 23½, preferred 90½; Sloss-Sheffield common 69, preferred 107; Tennessee Coal 87; United States Steel common 38, preferred 105½.

The annual report of the Virginia Iron, Coal & Coke Company for the fiscal year ended June 30 makes a favorable showing. Net earnings amounted to \$516,512 and the surplus after taxes and charges to \$89,679, against a deficit of about \$30,000 last year. The company's gross business was \$3,769,912. During the year a traffic agreement was made with the Norfolk & Western Railway by which the company gets freer shipments of its products and some concessions in freight charges on raw material shipped to its furnaces. The controlled Virginia & Southwestern Railway reports a surplus for the year of \$119,906, which is a gain of \$57,330 over the previous year. President Henry K. McHarg says that the company during the year sold property to the amount of \$230,000. This money and some minor real estate sales, beside sinking fund operations, allowed a cancellation of \$300,000 of the Carter Coal & Iron Company's first mortgage bonds. The company has made many improvements and additions to its property.

The Tennessee Coal, Iron & Railroad Company has made an application to the Stock Exchange to list \$350,000 general mortgage 5 per cent. gold bonds dated January 1, 1901, and payable in 1951. These bonds have been sold to reimburse the company for moneys paid out from the treasury for improvements and betterments.

Wall street has a report that the United States Steel Corporation will increase its bonded indebtedness by at least \$30,000,000 as soon as the state of the bond market will permit. When the second mortgage 5 per cent. 10-60 year bonds reach par it is the intention of the management to sell the unissued portion of the \$50,000,000 authorized to be sold for cash at par and to utilize the cash from the sale of these bonds when made to round out its comprehensive improvement and extension plans.

**Dividends.**—Westinghouse Electric & Mfg. Company has declared a quarterly dividend of 2½ per cent. on preferred assenting and nonassenting stocks, payable October 10.

Ohio Fuel Supply Company has declared the usual quarterly dividend of 2½ per cent., payable October 14.

Pittsburgh Plate Glass Company, Pittsburgh, has declared the usual quarterly dividend of 1½ per cent., payable September 30.

American Nut & Bolt Fastener Company, Pittsburgh, has declared the regular quarterly dividend of \$1.50 per share on the capital stock, payable October 4.

Chicago Pneumatic Tool Company has declared a quarterly dividend of 1 per cent., payable October 25.

## The Machinery Trade.

NEW YORK, September 27, 1905.

Manufacturers of and dealers in about all classes of machinery used in steel mills, foundries and machine shops are experiencing an excellent trade, as are also producers of special lines which have been developed for the economical handling of raw material. As the special machinery is gradually perfected its use is becoming more general, as the great saving made by the installation in one works necessitates the equipment of other plants that their efficiency may be maintained. Of the machinery used for handling raw material that for unloading ore, coal, &c., from boats of large tonnage has been in good demand of late and its popularity is constantly growing. Builders of this class of mechanical equipment are confident that this winter will see a great impetus given their trade. The installation of the grab bucket system at Conneaut, Ohio, has been a marked success. That plant has unloaded 10,000 tons of ore in three hours at a cost of about 1½ cents per ton, as against a cost of about 16 cents per ton by the former method, when much hand labor was employed. The great saving of cost in handling, aside from the celerity with which the work is done, is of sufficient recommendation to induce other large users of raw material to install an efficient plant.

The larger builders of power plant equipment are exceptionally busy and in some cases cannot make deliveries within anywhere near a reasonable time. One of the largest boiler makers is months behind and it would not be surprising to hear almost any time of the preparation of plans for increased facilities.

### Consolidation of Boiler Makers.

The announcement that the water tube boiler department of the Aultman & Taylor Machinery Company of Mansfield, Ohio, has been consolidated with the Stirling Company, Barberton, Ohio, created considerable interest in the machinery trade, and although the details of the merger will not be complete for some time it is understood that the company will have a capitalization of about \$4,500,000. With its allied interests the Stirling Company will be able to offer practically any style of water tube boilers, and it is understood that plans are being perfected for bringing out new types not now manufactured at either the Stirling or Aultman & Taylor shops. The transfer of the boiler department of the Aultman & Taylor Company does not include any property transfer, but it has been announced that the shops will continue at Mansfield. The Stirling Company will rent the factory site and after an inventory of the machinery, tools, &c., has been finished work will be carried on there as usual. The Aultman & Taylor Company will confine its attention in the future to the sale of threshers and other farming machinery, and it is understood that the concern intends to do business on a more extensive scale than heretofore. It is possible that a new name will be adopted by the Stirling Company, in which will perhaps be incorporated the title "Cahall," under which name the boilers manufactured by the Aultman & Taylor plant are marketed. The plant at Mansfield is one of the largest water tube boiler plants in the country and its alliance with the Stirling Company will make that company a decided factor in the market. The company is preparing to push its export business and will develop as a strong competitor for foreign trade.

### Important Machinery Requirements.

The American Bridge Company, Pittsburgh, is in the market for a large number of machine tools.

The prediction made in these columns some time ago that the United States Steel Corporation would soon be purchasing a considerable quantity of machinery has been verified by the recent action of the company which has authorized some large purchases of rolling mill equipment for Pennsylvania plants. Large orders have been placed for the plants at McKeesport and Sharon and it is understood that the company has other purchases in contemplation. With its vast system the company is always buying more or less machinery, but of late a more than ordinary number of orders have been placed and a large part of the buying has been done from the company's general offices at 71 Broadway, New York, where the purchasing committee, which was formed some time ago, has its headquarters. Dealers in heavy rolling mill equipment will be following the company's movement for some time to come, and it is probable that this city will capture a large portion of the orders to be placed.

The practice of the Pennsylvania Railroad Company of providing for the requirements for tools and machinery by annual programmes from the various divisions explains the dearth of inquiries at this period. The motive power department is at present engaged in assembling information in the various shops on the divisions which will enable it to obtain an estimate of the requirements for the ensuing year.

The indications point to heavy purchases to provide for depreciation and new equipment. The present week is distinguished by no inquiries, with the exception of the two following items: One motor driven hydraulic pump, to be used for operating hydraulic riveting and punching machines; dimension planing machine, to take material 20 inches wide and 20 inches deep, to have table 40 feet long.

The Pennsylvania Railroad has been closing its contracts of late for the additions to the equipment of its Altoona shops and orders have been placed with the Case Mfg. Company, 85 Liberty street, New York, for two 65-ton cranes with 95 feet span and one 15-ton crane with 60 feet span, besides 21 jib cranes of from three to ten tons.

The Pittsburgh & Lake Erie Railroad has made plans for the building of new repair and machine shops at Glassport, Pa., near Pittsburgh. It is said the railroad will spend \$100,000 in building these shops and considerable equipment for iron working tools will be needed.

O. P. Redford and another representative of the Richmond Forging Company, Richmond, Va., were in New York during the past few days interviewing machinery men and getting bids on machinery, and it is thought that before long some large contracts will be closed with the fortunate machinery men who were seen by them. The Richmond Forging Company was recently incorporated with a capital stock of \$100,000 to install a plant for the manufacture of drop forgings on a site on Belle Isle which was leased from the Old Dominion Iron & Nail Works. The electrical plant of the new company will be operated by water power furnished by the Old Dominion Company and it is understood that a large quantity of machinery will be required to start operations. It is understood that few if any contracts were actually closed by the visitors, but the New York market will undoubtedly profit from the visit.

The United States Printing Company, 91 North Third street, Brooklyn, is overhauling its plant preparatory to equipping its machinery with electric motors. The company has specifications out for 200 motors which are to be installed at an early date and a number of New York houses are bidding on the proposition. The installation of the motors will necessitate the purchase of some other machinery, it is thought, and the total amount of the orders to be placed will aggregate a tidy sum. It is understood that an early delivery is specified and the orders for the machines will be given before long.

We understand that the New York State Steel Company, Buffalo, N. Y., is asking bids for the equipment for its proposed new structural steel plant. This company was recently incorporated with a capital stock of \$1,000,000 and intends to erect a 60-ton plant upon a 25-acre site adjacent to the plant of the Lackawanna Steel Company.

The Marine Mfg. & Supply Company, 157-158 South street, New York, is in the market for machinery for equipping its new plant at New Brunswick, N. J., where it is moving its manufacturing department. The new plant occupies the larger part of a city block and includes machine, blacksmith and pattern shops and an iron and brass foundry. The products are steering wheels, windlasses, hoisting winches, crabs, derrick fittings and a complete line of shipbuilding and contractors' supplies. The company will be pleased to receive catalogues from manufacturers.

Quite a quantity of machinery will probably be required by the Kellogg-McCrum-Howell Company, 46 East 20th street, New York, for equipping its new plant. The plant of the company, formerly located at Blairsville, Pa., was destroyed by fire in August and the company intends to rebuild at Uniontown, Pa. The new plant will have a largely increased capacity over the old one and it is hoped to have it completed by the first of the year. We understand that the company is now at work upon the plans for the new buildings and also specifications for the machinery.

The Connellsville Machine & Car Company, Connellsville, Pa., whose plant was recently destroyed by fire, has been reorganized and granted a charter and plans are being made to rebuild the plant on a larger scale. This concern manufactures complete equipment for coal and coke works and expects to be able to start work on its new plant within a very short time.

The work of constructing a new factory to replace the plant of Cawley, Clarke & Co., paint manufacturers, at Vanderpool street and Avenue C, Newark, N. J., which was destroyed by fire several weeks ago, is being rapidly pushed forward. The new factory is to be of brick construction, two stories in height, and 54 feet wide by 200 feet long. It is understood that the plans include an extensive power plant, and machinery will be required for mixing the ingredients used in making the paint. G. W. Campbell, of Newark, is the architect and engineer in charge of the operations.

Bids will be opened on Monday at the office of the Department of Education, City of New York, corner of Park avenue and Fifty-ninth street, for machinery and fittings, including pattern making benches, for the shops of the Stuyvesant High School, at 225 East Twenty-third street.

It will not be long before machinery dealers in New York will be given a chance to bid on some pretty large contracts.

for equipment for the hydraulic power plant to be constructed on the Tennessee River to furnish electric power for the city of Chattanooga. The operations are to be carried forward by the Chattanooga & Tennessee River Power Company, and Col. John Bogart, 16 Exchange place, New York, is the engineer in charge. He will direct both the construction of the plant and its equipment. The United States Government is to construct a lock and dam at the point where the plant is to be located and contracts for that and the power station will soon be awarded, after which the machinery details will be taken up. Preliminary operations have already been commenced, and it is understood that before many weeks the machinery details will be taken up. The power plant will be from 30,000 to 40,000 horse power. The plans show that while the plant will be located about 33 miles from Chattanooga by river it will be but 12 miles from the city in a direct line, and the transmission line will as a result be 12 miles in length. The lock will be 60 feet wide and the dam 40 feet high. The power house will be adequate for 14 units of 3000 kw. each and there will be a transformer house and other buildings. A large amount of construction machinery will be needed in building the lock and dam. It has been announced that an attempt will be made to complete the power house during the winter, and it is probable that most of the equipment will be purchased in this city.

The Mesta Machine Company, through its New York office at 85 Liberty street, has sold to the Randolph-Clowes Company a 200 horse-power Corliss engine, together with a hydraulic pump, open hearth steel shafting, gears and all necessary appurtenances.

The New York, New Haven & Hartford Railroad has placed an order with the Westinghouse Electric & Mfg. Company, Pittsburgh, for 25 electric locomotives, to cost about \$30,000 each. Each locomotive is to weigh 78 tons and be capable of hauling a 200-ton train at an average speed of 26 miles an hour.

Chief Engineer De Varona of Brooklyn has reported to Commissioner Oakley in favor of the D'Olier Engineering Company, New York, as the lowest bidder for the eight electrically driven pumps for the high pressure salt water fire system in Brooklyn. Five of the pumps are intended for the Joralemon and Furman street station and three for the station at Willoughby and St. Edwards streets.

#### Plans to Enter New York.

Two separate companies, which eventually are to be merged, have been incorporated at Trenton, N. J., for the construction and operation of a proposed high speed electric railway between Newark, N. J. and New York, which will be carried under the Hudson River by tunnel. All the preliminary plans for the project have been completed and sufficient capital has been subscribed to make the plan an absolute certainty, and before long operations will be started. The construction of the road and the tunnel will mean a great deal to New York machinery dealers, as a large amount of equipment will be purchased for carrying out the project. The two companies formed to build the line between Newark and Jersey City are the Newark & Hackensack River Railway Company and the Jersey City & Hackensack River Railway Company. In each instance \$100,000 capital has been subscribed and the incorporators, who are the same for both corporations, are: Thomas N. McCarter, president of the Public Service Corporation; Charles A. Sterling, East Orange, N. J.; Albert B. Carlton, Elizabeth, N. J.; John J. Burleigh, Merchantsville, N. J.; Anthony R. Kuser, Bernardsville, N. J.; Thomas C. Barr, Orange, N. J., and Mark T. Cox, East Orange, N. J. The Newark & Hackensack River Railway Company will construct the proposed line from Park place, Newark, where a terminal will be located, to the Hackensack River, and the other company will build the line from the Hackensack River to the intersection of Erie and Fourteenth streets, in Jersey City, while the Interstate Tunnel Company, which was formed several days ago, will build the tube under the river. John B. McDonald of this city is identified with the tunnel project and he, together with S. L. F. Deyo, has made an application to the Rapid Transit Commission of New York for a franchise to construct a subsurface railroad from the center of the North River to continue under Chambers street to a point near Pearl street and Park row. The new line will be an outlet into New York for the system of the Public Service Corporation of New Jersey, which is promoting the plan. The Public Service Corporation operates all the surface trolley lines in the counties of Hudson, Essex, Passaic, Union and Middlesex, in New Jersey, comprising in all about 550 miles of line. It is understood that there is to be no delay in beginning the work and operations will be started, it is said, as soon as the necessary permission is given by the authorities. The construction of the high speed road will probably include an extension of the large power plant recently constructed on the Hackensack meadows by the Public Service Corporation, and besides the large amount of construction machinery and material which will be required in building the road a large amount of power plant equipment will be needed to complete the project.

## Chicago Machinery Market.

CHICAGO, ILL., September 26, 1905.

Second-hand machinery is moving better than at any time this year, this stimulated demand being largely due to the inability of the machine tool manufacturers to make early deliveries. Some of the larger concerns are unable to make deliveries on gear cutters in less than four to six months, large boring mills two to four months and lathes about two months. General demand for upright drills, planers and lathes is heavy and the outlook for big fall demand is promising.

The bulk of the machinery requirements for the various shops of the Chicago, Burlington & Quincy Railroad has been placed. The original inquiry, which was issued about six months ago and which would have required an appropriation of close to \$150,000, was considerably curtailed about six weeks ago, when a revised list of equipment was issued and the appropriation is understood to be not much over \$100,000. Some of the larger tools, including two driving wheel lathes, have not yet been placed, but it is probable that contracts will be closed within the next ten days. The Niles-Bement-Pond Company secured contracts for equipment amounting to about \$28,000, including one 84-inch cylinder planer, car wheel lathes, an electric traveling crane, punches and shears and ordinary lathes. The contract awarded to Manning, Maxwell & Moore calls for about \$20,000 worth of machinery and includes an assortment of lathes, one Putnam car wheel No. 2 boring machine, one No. 7 Hillis & Jones punch, an 8-foot Betts boring mill and a number of wet tool grinders. The Marshall & Huschart Machinery Company was awarded four No. 4 Cincinnati milling machines and a 34-inch Bullard boring mill. Contracts for power equipment, including one stationary engine and 3000 horse-power boiler capacity, have not yet been placed.

The construction work on the Chicago, Hamilton & Dayton Railroad shops at Ivorydale, Ohio, about 7 miles from Cincinnati, is now well under way. The Arnold Company, Chicago, has the contract for the entire improvement, including buildings and the complete power, light, air, heating and water systems. A 14-stall engine house will be provided and will be served by a transfer table, which also serves the nine-stall erecting and boiler shop used for engine repairs. In addition to this a planing mill, storeroom, office building, oil house and other small buildings will be erected. The engine house and oil house will be constructed of reinforced concrete. The power equipment will consist of two 62½-kw. direct current generators direct connected to high speed engines, a 500-foot air compressor and the necessary boilers, pumps and power house machinery. The tools will be motor driven, part of them in group drives and a few of the larger tools by individual motors. The entire work is in a preliminary stage at present, the work on the buildings having been in progress for about four weeks. Most of the equipment has been purchased and detailed plans for the entire plant are now very nearly completed.

The Illinois Steel Company is adding considerable equipment to its South Chicago machine shops and has inquiries out for drills, planers and miscellaneous machine shop equipment. It is also in the market for several electric traveling cranes and the list of equipment for the company's new open hearth plant is expected shortly.

The American Steel & Wire Company is in the market for a small lot of miscellaneous tools for its Anderson, Ind., plant.

The H. A. Petersen Mfg. Company, Chicago, will buy for a new factory at Harvey, Ill., an electric traveling crane, motors, a gasoline engine, an enameling furnace and other tools used in the manufacture of structural iron and electrical appliances.

The capacity of the gear cutting plant of Wm. Ganschow, 12 South Clinton street, Chicago, has been considerably increased by the installation of a number of large tools, including one Bullard 6-foot boring mill for turning large gear blanks and two Gleason planers, respectively 24 and 36 inches. In addition considerable smaller machinery has been added.

The Wm. Kavanaugh Company, Zelienople, Pa., will equip a foundry for the manufacture of castings for its gas engines and will require boring mills and lathes within the next 60 to 90 days.

The Pike Coal & Coke Company and the Greenough Coal & Coke Company, Pikeville, Ky., have leased coal land from the Big Sandy Company of Pikeville and both companies will purchase and install considerable mining machinery.

The Almaden Mines Company, W. T. Dumbleton, Idaho Springs, Col., consulting engineer, will purchase machinery for its mines.

J. C. Vance, Urbana, Ohio, is contemplating the removal of his cotton mill from Chattanooga, Tenn., to some point in Alabama and adding the following machinery: One 40-inch braker and feeder picker, two 40-inch intermediate pickers, two 40-inch finisher pickers, sixteen 40-inch revolving flat cards, one 60-spindle slubber, four finishing speeders,

twenty 208-spindle spinning frames, four 100-drum cone winders, roving cans, shafting, pulleys and belting.

The Gardner Machine Company, Beloit, Wis., which was organized in April of the present year, is about to place on the market a new line of Gardner disk grinders. The officers of the company are: F. N. Gardner, inventor of the disk grinders of that name, president; N. J. Ross, vice-president; W. H. Grinnell, secretary and treasurer.

Charles H. Besley & Co., manufacturers of Gardner grinders, Chicago, are supplementing their plant at Beloit, Wis., with a new factory, two stories in height, 50 x 175 feet, of reinforced concrete construction. Considerable of the equipment will be of special design.

The Bruner Steel Wagon Company, Wapakoneta, Ohio, will enlarge its factory by the erection of a two-story building, 60 x 100 feet. New machinery will be added, though it has not been decided as yet what the purchases will include.

The Marshall & Huschart Machinery Company, Chicago, last week shipped three carloads of machine shop equipment to the Lufkin Foundry & Machine Company, Lufkin, Texas. Among the larger tools were one 60-inch boring mill and one No. 5 milling machine.

#### Municipal and Power Work.

Proposals for furnishing electrical apparatus and materials for installation in the power house of the sanitary district of Chicago will be received by the clerk of the district, Security Building, Chicago, until October 11. The work includes a quantity of electrical apparatus and one electric traveling crane capable of lifting a dead load weight of 40 tons from floor to highest point of hoist in four minutes, provided with a high speed for loads of 20 tons and under, and a high speed auxiliary hoist of 8 tons capacity mounted on the same trolley.

Sealed proposals are being received by the city electrician of Chicago and will be opened on October 2 for furnishing the department of electricity with one 750-kw. three-phase 60-cycle alternating current generator, with its exciter unit and switchboard equipment, for the H. N. May municipal electric light plant.

The city of Chicago will receive bids until October 4 for furnishing and erecting in the boiler room of the Lake View pumping station, Montrose boulevard and Clarendon avenue, four 250 horse-power internally fired horizontal return tubular boilers, fitted with furnaces and necessary appurtenances. J. M. Patterson is Commissioner of Public Works.

The Pere Marquette Light & Power Company, Pentwater, Mich., of which Harry McDargh, Dayton, Ohio, is engineer, will require two generators and two pair of water wheels, with accessories, for the development of a 700 horse-power hydroelectric power plant.

The Russell Mining Company, Russell Gulch, Col., contemplates the installation of the following machinery: Hoisting engine of 50 horse-power or more, boilers of 100 horse-power and possibly a compressor plant.

The Wichita Railroad & Light Company, Wichita, Kan., is installing one 400 horse-power Sterling boiler, together with a 125-foot stack for the same, and will in the near future put in a 500-kw. direct connected generator connected to a Corliss engine of some type, together with a surface condenser and a hot water heater of sufficient size to take care of the plant.

### Cincinnati Machinery Market.

CINCINNATI, OHIO, September 26, 1905.

Trade in machine tool circles continues to be active and all of the plants are booked ahead far into the winter. Foreign demand is gradually increasing and becoming more general from all parts of Europe. Ernst Müller, New York representative of Schuchardt & Schütte, spent a day or two in the city during the past week in the interest of his firm. He reports a very satisfactory condition of affairs throughout the country, with everything pointing to a very large year.

The annual meeting of the National Machine Tool Builders will be held in New York on October 16 and 17. Headquarters will be at the Hoffman House. It is almost certain that prices will be advanced on all electric driven machine tools, as at present figures the margin of profit is too small to justify building them. General conditions of trade, with a tendency to increase the prices on all machines, will be taken up and discussed at length, as will also tariff influences with foreign countries. These subjects are of paramount interest to machine tool builders generally and no member can afford to be absent. It is understood that the Cincinnati contingent will be well represented at this meeting.

Another new factory has been added to the list through the instrumentality of the Industrial Bureau. Several weeks since the bureau learned from a Cincinnati stockholder that the Rock Island Battery Company, now located at Rock Island, Ill., intended to remove to Chicago. Secretary Finch at once went to work, and after much effort induced them to locate here. The property secured is at 456 East Sixth street, which has been leased for three years, with the privilege of three more. The securing of this plant means the

addition of an entirely new kind of industry—the manufacture of electric batteries. The company will remove to Cincinnati before the first of November, as soon as certain changes have been made in the buildings, and will begin operations with one hundred hands. A number of officers and employees of the company will remove here with the business. M. A. Loeb is manager; Meyer Rosenthal, of this city, is president, and Mayer Oettinger, vice-president. We are unable to say just what will be required in the shape of new machinery, but we are told that a number of tools will be added to the present equipment, which will be increased as necessity requires.

Considerable difficulty has been experienced in all of the shops in securing the right kind of apprentices, who after serving their time have sufficient education along general lines to successfully carry out the ideas of their superiors. A solution of this problem has been attempted by the Houston, Stanwood & Gamble Company, with remarkably good results. In a separate building, adjacent to its plant, it has established an apprentice school, which has been in successful operation for the past eighteen months, and into which some novel features enter. In this school apprentices spend six hours a week in the shop's time, under pay. The attendance, however, is not compulsory, as in the apprentice papers which are drawn up the company neither guarantees to furnish instruction nor are apprentices bound to attend school, the arrangement being purely voluntary on the part of each. Apprentices are divided into four groups, one group attending school from 8 to 10 o'clock, another from 10 to 12, another from 1 to 3, and the last from 3 to 5 on Mondays, Wednesdays and Fridays of each week. Three general subjects are taught, mathematics, English and drafting, mathematics consisting of arithmetic, elementary algebra and geometry. In English several books are read aloud, the dictionary being extensively used in determining the pronunciation, definition and spelling of the words. At regular intervals written work is required. In drafting, the instruction is rather elementary, consisting of detailing engine parts from measurements. Later, development of surfaces, intersections and the elementary portion of descriptive geometry are taught. In connection with mathematics a certain amount of elementary mechanics of an experimental nature is undertaken, with such simple apparatus as has been devised by the instructor. Experience derived from this school, as far as its influence on the apprentice is concerned, has been found to be satisfactory, and the company is more than pleased with the results.

The John Steptoe Shaper Company advises that it has sufficient orders on hand to run the remainder of the year and has been compelled to turn some away. Complaint is made of inability to secure enough men to handle present equipment, good machinists being scarce.

The R. K. Le Blond Machine Tool Company shipped two carloads of tools to Japan last week and has some under way. Prices are firm and trade both at home and abroad is good, the difficulty being in making deliveries as required.

The Siskford Drill & Tool Company reports a very satisfactory trade. The railroads are heavy buyers and the company has secured a number of large contracts from this source. Foreign demand is said to be improving and becoming general.

The J. A. Fay & Egan Company is now occupying its new addition and all is complete, with the possible exception of the elevators, which are being installed. This will give the company an opportunity to exhibit its tools in such a manner as will be satisfactory to itself and also the purchaser. Trade is said to be exceptionally good from both foreign and domestic sources.

The Diets Machine Tool Company has increased its capital stock from \$25,000 to \$75,000.

### New England Machinery Market.

WORCESTER, MASS., September 26, 1905.

It has developed since the discussion of an advance in prices of machine tools has been opened that the manufacturers, at any rate the builders of engine lathes, are not a unit in the belief that it is expedient to make the increase at this time. All without exception agree that the additional cost of production warrants better prices; that labor and materials are so very much higher that the present margin of profit is not what it should be as compared with other lines of machinery of all descriptions. But those who believe that present prices should not be altered argue that there are other conditions to be considered. One of the most prominent of the New England lathe manufacturers, a former officer of the National Machine Tool Builders' Association, in discussing the question, made the following statement: "It is true that times are exceedingly good and an increase in prices would probably not affect the demand for the immediate present. Materials have advanced, skilled labor is very scarce. Lathes cannot be built at the same profit as a year ago or even a few months ago. We are not getting what would be conservatively called a fair profit. But I am opposed to increasing prices, for several reasons.

If there was to have been an increase it should have been made months ago, at the beginning of the present good times, when it first became evident that another period of unusual demand was at hand. Now if the advance is to be made it cannot be accomplished immediately, not until the association has its meeting and threshes out the question. Times like these do not last. They must have their reaction, though it may not be soon. But when it does come and the market falls to pieces, then, at increased prices, the cutting will be greater in the keen competition for the remaining business than it would be at present prices. We must not forget that the National Association does not by any means embrace the entire field of lathe manufacture. There are outsiders whose combined product is an important factor in the trade and they will not adhere to prices which the association may set. This is particularly true with lathes as compared with other lines of machine tools, for lathes are not difficult to build in the standard types. I mean by this that a first-rate mechanic can go out of the shop of a lathe builder and start in business on his own account with small capital, on a small scale, to be sure, but in the aggregate of numbers of such men their product is quite large as compared with the total production of the members of the association."

Another equally prominent lathe builder in speaking of the proposed change in prices did not take so pronounced a view of the matter, but he, too, believed that the competition from outside of the association should be taken into serious consideration, though he did not deem this by any means an insurmountable objection to favorable action as to advancing prices, provided both the Western and Eastern members of the association agree to abide by the action of the association, as they have done by the agreement now existing, which he thinks has been very well lived up to. All through the lines of machinery and mechanical apparatus of all sorts in which metal is employed, including engines, pumps, electrical appliances, textile machinery, &c., there is none in which the profits are so small as are those of the machine tool manufacturer to-day, he said.

The question will give importance to the next meeting of the National Machine Tool Builders' Association. The advocates of the advance are strong in their opinions, and it is probably well that there are those with contrary views, for they assure a careful consideration of the matter, not only in the meeting, but in the preliminary action of the special committee of the lathe section of the association. The planer builders have a similar vital interest in the question of advancing prices, and the builders of other lines of machine tools must be as deeply affected, for the same condition of labor and materials affects them just as it affects the lathe builders, who have, according to the usual practice, taken the initiative in the matter. In fact, the proposed change in prices has been an absorbing topic, not only among the manufacturers, but among the dealers and customers, since it was first brought to the attention of the trade in *The Iron Age* of August 31.

Not a few improvements in machine tool construction and mechanism have been worked out by New England machine tool men during the past few months and some of them have passed the experimental and testing period and will soon be placed on the market. Interesting among them are designs for four-speed attachments for planers, which at least three of the planer builders have developed and are soon to give to those customers who wish greater scope in their planer work. In fact, the demand for variable speed planers is very rapidly increasing. The equipment is designed for both pulley and motor drive, the usual idea being to maintain a constant speed return with a variable speed cutting stroke.

The Maine Central Railroad is contemplating, so it is reported, an extensive addition to its car repair shops at Waterville, Maine. The company is said to be handicapped by insufficient facilities for this class of work and the Waterville shops are believed to be selected for the building of the required enlargement.

Manufacturers of electric and naphtha motors will be interested in tests which the Navy Department is to make with naphtha and electric launches at the Training Station, Newport, R. I. Two launches for the purpose are being built at the Charlestown Navy Yard, one, 33 feet long, to be fitted with gasoline engine, the other, 28 feet, long, to be equipped with electric motor and storage batteries. Steam launches are universally used in the American Navy, including those carried on the warships, and many officers believe that these can be replaced to advantage by either naphtha or electric boats. The tests will be made in connection with the work of the torpedo gunnery practice ship *Vesuvius* and the regular work of the Training Station.

The new plant of the J. H. Sessions & Son Company, Bristol, Conn., manufacturer of trunk hardware, already alluded to in less detail in this column, will be an extensive one. Factory A will be 54 x 99 feet and three stories and basement and will be devoted to offices and shipping room; factory B will be 52 x 105 feet, one story and basement, and will be devoted to general manufacturing; factory C will be three stories and basement, 42 x 75 feet, and will be

given over to the press and machine shop. Factory D, 44 x 105 feet, will be used for storage; factory E will be a one-story power plant; factory F, 65 x 73 feet, will be the plating department, and factory G, 45 x 56 feet, will be the jappanning department. The buildings will be of brick, steel and asphalt.

Charles H. Metz, Waltham, Mass., manufacturer of motor cycles, has consolidated his business with that of the American Motor Company, Brockton, Mass., and the Metz machine, both double and single cylinder, will be made at the company's factory at Brockton. Mr. Metz will have charge of the mechanical end of the business.

The J. G. Blount Company, Everett, Mass., has added a line of motor driven speed lathes.

## Philadelphia Machinery Market.

PHILADELPHIA, PA., September 26, 1905.

Orders are being received in good quantity, but as heretofore most of the business taken is made up of a quantity of small orders, which in the aggregate, however, make quite a good amount of business. The demand does not seem to be specialized to any extent—that is, run to any one or more classes of tools—but is fairly well distributed along the general line. Prompt deliveries continue prominent as an important factor in the closing up of many orders, and dealers are more or less handicapped in this matter, as many manufacturers cannot promise shipment on some sizes of tools for three and in some cases six months' time. Some few orders have been closed during the past week for entire shop equipments, but these have all been small and did not require many heavy tools. The various railroads continue placing their orders in small lots, more or less regularly distributed among the various manufacturers and dealers.

Inquiries have generally improved—this condition is to be noted in every branch of the trade—and more business appears to be in sight than at any time for several months past, but as already mentioned the demand does not seem to be in the direction of large quantities of tools, but appears to be confined to a few tools here and there for renewal or minor extensions. The various users of machine tools are so crowded with work that tools are in many cases being continuously driven at their utmost productive capacity, which usage frequently means a comparatively short life and consequent early replacement of the tool.

Foreign demand continues to improve, and the outlook for further business is more favorable. As the internal affairs of both Russia and Japan rearrange themselves, which they undoubtedly will as fast as the recent peace negotiations will permit, new requirements in the way of machinery and tools will develop, and a large share of this business will, it is confidently expected, come to this country. Manufacturers in this section have recently taken considerable business for the Panama Canal work, and more is expected as this work becomes further advanced.

Both manufacturers of and dealers in the smaller engines, boilers and machine shop supplies report an improvement in their particular lines. Boilers have probably been the most active, but the demand for engines has increased slightly during the week past. Second hand machinery merchants do not find the trade as active as might be desired, still a good volume of business, covering a variety of lines, has been transacted.

There has been some improvement recently in the foundry trades. Steel casting plants, on the whole, continue the most active, although many of the gray iron foundries have taken on a good volume of business and find it hard, in cases, to make deliveries as promptly as their customers desire. For some classes of general foundry work, however, there is sharp competition, as quite a number of the plants could handle a greater tonnage without inconvenience.

The Pennsylvania Railroad will shortly begin work on a new reservoir to supply water for its shops and roundhouse at Todd's Cut, near Wilmington, Del., the capacity of which will be about twenty million gallons. A complete pumping station is to be installed in connection with this work.

The Hess Machine Works has during the past week shipped two sets of file making machines to Germany and four sets to England, several of these tools being of a new type. This concern also reports an increasing demand for file making machinery, as well as for special tools from the domestic trade, and is quite busy in all departments.

The Espen-Lucas Machine Works notes an increase in the number of orders received for cold saw cutting off ma-

chines, as well as for other special tools. Sales of several bar saws have recently been made to various machine shops, while I-beam and foundry saws have been taken by structural steel mills and steel casting plants. This company has recently made deliveries on a number of bar and beam saws to local and nearby parties, while special tools have been furnished various other concerns.

H. B. Underwood & Co., Inc., has received a number of good orders for its various portable tools and is busy in all departments of the plant. This company has recently shipped several portable boring bars to parties in South America and has orders in hand for portable boring bars and valve seat rotary planing machines for export to London, England. The domestic demand for portable crank pin turning machines, boring bars and rotary planing machines is good, particularly from the western railroad shops. Several tools have been shipped the Pennsylvania Railroad for its Altoona, Pa., shops, while other Southern and Eastern roads have also been furnished with various portable tools made by the above company.

Dienelt & Eisenhardt, Incorporated, continue busy. The foundry has a good quantity of work on hand, particularly for marine purposes, while the machine shop is busy on a variety of general work, including a number of tube expanding machines. Orders for Monarch electric motors are being taken freely, as are also orders for hydraulic jacks from the various railroad companies.

The American Pulley Company notes a continued good demand for pulleys both from foreign and domestic sources. Export orders, while more numerous, are for smaller quantities individually than during the last month, but this condition is considered only a temporary one. Shipments for export to New Zealand, England, Switzerland and the Scandinavian countries are to be noted. There is a good domestic inquiry for pulleys from the local and nearby territory, while shipments in carload lots have been made to both the Southern and Western customers.

The E. H. Mumford Company notes a large increase in the demand for molding machines during the past week. Orders have been taken, among others, for two 36-inch power ramming machines, with vibrators, and two 13 x 18 inch split pattern machines for parties in Massachusetts and for one large power ramming machine for a New York concern. Inquiries have been received in good quantity for all classes of molding machines and appliances, and future conditions for this trade are considered very satisfactory. Among recent deliveries of molding machines by this company were two 14 x 16 inch power ramming split pattern machines for the new brass foundry of the Pennsylvania Railroad at Altoona, Pa.

## Government Purchases.

WASHINGTON, D. C., September 26, 1905.

The Isthmian Canal Commission will soon ask bids for six earth spreaders, similar to those purchased a short time ago.

The electrical engineer, United States Reclamation Service, Los Angeles, Cal., will receive bids until November 2 for one 260 horse-power water wheel and one or more 140 horse-power water wheels, with gate valve, pipe connections and governors, for the Roosevelt power house, Salt River project, Arizona.

Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until October 31 for an electric traveling crane and other supplies for the Mare Island and Puget Sound navy yards.

The Bureau of Supplies and Accounts will receive bids until October 10 for a milling machine, hydraulic jacks and various other supplies for the Eastern navy yards.

Bids will be received at the Bureau of Supplies and Accounts, Navy Department, Washington, until October 17 for air hoists, motor, motor drive outfit, steam separator, centering machine, electric traveling hoist and other supplies for the Mare Island and Puget Sound navy yards.

The Department of Interior will receive bids until October 17 for a 2-ton ice machine for Chilocco, Okla.

The following bids were opened September 19 for supplies for the various navy yards:

Bidder 1, Allis-Chalmers Company, Baltimore, Md.; 4, American Wood Working Machinery Company, New York; 8, Alliance Machine Company, Alliance, Ohio; 17, Buffalo Forge Company, Buffalo, N. Y.; 24, Babcock & Wilcox Company, Philadelphia, Pa.; 31, Burke Electric Company, Erie, Pa.; 33, Baldwin Locomotive Works, Philadelphia, Pa.; 38, Chicago Pneumatic Tool Company, New York; 39, Crocker-Wheeler Company, Ampere, N. J.; 40, C. & C. Electric Company, New York; 47, James Clendenin, Baltimore, Md.; 52, Caldwell Bros. Company, Seattle, Wash.; 53, Chicago Pneumatic Tool Company, Chicago, Ill.; 55, Drew Machinery Agency, Manchester, N. Y.; 59, Dayton Pneumatic Tool Company, Dayton, Ohio; 62, Geo. Damon & Sons, New York; 63, Davenport Locomotive Works, Davenport, Ohio; 71, Frye, Phipps & Co., Boston, Mass.; 82, Fairbanks Company, New York; 75, Globe Engineering Company, San

Francisco, Cal.; 77, General Electric Company, Schenectady, N. Y.; 79, A. D. Granger Company, New York; 80, R. W. Geldart, New York; 86, Harron, Rickard & McCone, San Francisco, Cal.; 87, Hendey Machine Company, Torrington, Conn.; 88, Holtzer-Cabot Electric Company, Brookline, Mass.; 91, Handlan-Buck Mfg. Company, St. Louis, Mo.; 92, Hisey-Wolf Machine Company, New York; 94, Heine Safety Boiler Company, St. Louis, Mo.; 95, Hisey-Wolf Machine Company, Cincinnati, Ohio; 97, Hallidie Machine Company, Seattle, Wash.; 99, Independent Pneumatic Tool Company, Chicago, Ill.; 100, Ingersoll-Sergeant Drill Company, New York; 105, Arthur Koppell, New York; 107, J. B. Kendall, Washington, D. C.; 108, J. H. Leonard & Co., New York; 110, Lumley-Dobson Company, Norfolk, Va.; 112, Lima Locomotive & Machine Company, Lima, Ohio; 118, Mitts & Merrill, Saginaw, Mich.; 127, Manhattan Supply Company, New York; 128, Manning, Maxwell & Moore, New York; 129, Montgomery & Co., New York; 132, Wm. Wirt Clarke & Son, Baltimore, Md.; 141, National Electrical Supply Company, Washington, D. C.; 145, Niles-Bement-Pond Company, New York; 147, George A. Ohl & Co., Incorporated, Newark, N. J.; 157, S. M. Price Machinery Company, Norfolk, Va.; 162, Rahn-Mayer-Carpenter Company, Cincinnati, Ohio; 163, Rand Drill Company, New York; 165, Royce & Ricketts, Washington, D. C.; 171, Robbins & Myers Company, Springfield, Ohio; 174, H. A. Rogers Company, New York; 175, J. B. Roache, New York; 181, Smith-Courtney Company, Richmond, Va.; 184, B. F. Sturtevant Company, Hyde Park, Mass.; 188, Sprague Electric Company, New York; 191, H. B. Smith Machine Company, Smithville, N. J.; 199, Sherman-Brown-Clements Company, New York; 200, Stirling Company, New York; 201, Tatum & Bowen, San Francisco, Cal.; 206, Porter & Moore Company, Norfolk, Va.; 208, United Marine Supply Company, New York; 215, Vermilye & Power, New York; 216, Vulcan Iron Works, Wilkes-Barre, Pa.; 217, White Hardware Company, Norfolk, Va.; 219, Western Electric Company, New York; 220, Westinghouse Electric & Mfg. Company, Baltimore, Md.; 224, R. M. Wilkinson & Co., Incorporated, Norfolk, Va.

### Schedule No. 77.

Class 1. Six induction motors—Bidder 41, \$1309.55; 77, \$1170; 220, \$1262 and \$1247.

### Schedule No. 79.

Class 31. Five motors—Bidder 1, \$1164; 31, \$903.25; 39, \$952.30; 40, \$963; 52, \$1279.25; 75, \$1015 and \$1040; 77, \$1045; 97, \$1248; 171, \$1068.72; 188, \$926; 208, \$1054.

Class 32. Two motors—Bidder 1, \$478; 31, \$350.80; 40, \$430; 39, \$444; 52, \$569.75; 75, \$440 and \$450; 77, \$400; 97, \$556; 188, \$423.50; 208, \$484.

### Schedule No. 80.

Class 42. Two pneumatic breast drills—Bidder 53, \$180; 86, \$160; 99, \$101.50; 100, \$135; 128, \$135.50; 163, \$104 and \$147.20; 201, \$150.

Class 43. Six pneumatic hammers—Bidder 53, \$390; 59, \$368; 86, \$384; 99, \$345; 100, \$324; 128, \$224.10; 163, \$312; 201, \$347.

### Schedule No. 90.

Class 62. One locomotive—Bidder 33, \$5850; 63, \$3140; 105, \$5850; 112, \$5375; 216, \$3800 and \$4000.

### Schedule No. 91.

Class 71. Two 100 horse-power water tube steam boilers—Bidder 24, \$5367 and \$4887; 79, \$4490; 94, \$4700; 200, \$4450; 215, \$599.50.

Class 72. One portable electrically driven universal radial drill—Bidder 80, \$190; 92, \$190; 128, \$190.

### Schedule No. 92.

Class 81. Four 14-inch screw cutting engine lathes—Bidder 72, \$1080; 87, \$1344; 128, \$1120; 145, \$1040; 165, \$1040.

Class 82. Two 10-inch wood turning lathes—Bidder 127, \$120; 128, \$110.

Class 84. One Buffalo armor plate punch and shears—Bidder 17, \$100; 72, \$80; 80, \$79.95; 91, \$80; 128, \$80 and \$72; 129, \$78; 181, \$64.30.

Class 85. One bolt cutter—Bidder 55, \$236, \$244 and \$262; 72, \$225; 91, \$234; 128, \$228; 165, \$235; 181, \$234.

### Schedule No. 93.

Class 91. One bench grinder—Bidder 55, \$39, \$59 and \$76; 181, \$37.50.

Class 92. One improved tenoning machine—Bidder 4, \$210; 55, \$234, \$192 and \$182; 181, \$229; 191, \$232.

Class 93. One reciprocating mortiser—Bidder 55, \$209 and \$193; 181, \$184.98; 191, \$190.

Class 94. Installing one electric hoist and runway in building No. 62—Bidder 8, \$2250; 145, \$3245; 224, \$3430.

### Schedule No. 94.

Class 101. One 6-inch slotting machine complete—Bidder 128, \$720 and \$745; 145, \$912.

### Schedule No. 95.

Class 111. One band saw—Bidder 149, \$700; 181, \$750.

Class 112. One improved foot power squaring shears—

Bidder 55, \$161; 91, \$255; 110, \$90; 138, \$115; 157, \$100; 181, \$155.

Class 113. One improved foot power cornice brake—Bidder 55, \$199 and \$237; 110, \$185; 128, \$200; 147, \$200; 181, \$244.

Class 114. One key seating machine—Bidder 118, \$1254.

Class 115. One engine lathe—Bidder 72, \$455 and \$415; 87, \$615; 128, \$565 and \$515; 145, \$540; 162, \$454; 181, \$602.

Class 116. Three portable electrical bench grinders—Bidder 80, \$220.50; 91, \$180; 95, \$220.50; 128, \$220.50; 181, \$210.

#### Schedule No. 108.

Class 142. Two pipe bending machines—Bidder 38, \$270; 108, \$378; 128, \$300; 141, \$299; 219, \$270.

#### Schedule No. 111.

Class 191. Six electric motors—Bidder 39, \$360 and \$423; 77, \$540; 88, \$594; 184, \$510.

#### Schedule No. 112.

Class 208. Twelve hydraulic jacks—Bidder 71, \$516; 80, \$538.38; 107, \$498 and \$453.60; 110, \$540; 127, \$516; 128, \$515.70; 129, \$493.80; 132, \$518.88; 157, \$336; 174, \$501.60; 175, \$423.84; 199, \$514.50; 206, \$468; 217, \$262.80.

The following bids were opened September 16 for a 15-ton auxiliary hoist for the 100-ton crane at the New York Navy Yard:

R. G. Packard Company, New York, \$15,519.

Brown Hoisting Machinery Company, Cleveland, Ohio, \$18,762.

The Isthmian Canal Commission has awarded the contract for 120 mogul locomotives to the American Locomotive Works, New York, at an estimated figure of \$1,400,000. Bids were also submitted by the Lima Locomotive Works and the Baldwin Locomotive Works.

The following awards have been made by the Isthmian Canal Commission under bids opened July 19, serial number 240:

Morris Machine Works, New York, class 1, item 1, centrifugal sand pump and engine, \$4620.

Rumsey & Co., Limited, Seneca Falls, N. Y., item 2, centrifugal pump, \$223.55; item 6, centrifugal circulating pump and engine, \$219.

Henry R. Worthington, New York, item 4, boiler feed pump, \$91.70; item 7, surface condenser, \$613.70; item 8, two duplex steam pumps, \$2785.24; item 9, three internally fired boilers, \$2087.25.

A. S. Cameron Steam Pumps Works, New York, item 5, air pump, \$271.50.

Henry H. Meyer, Baltimore, Md., class 3, item 10, two double cylinder double friction drum hoisting engines, \$2226.50.

Announcement is made that the New Zealand International Exhibition will be held at Hagley Park, Christchurch, Canterbury, New Zealand, in the months of November and December, 1906, and in January, February, March and the early part of April, 1907. Premier Seddon is president of the exhibition, G. S. Munro executive commissioner and E. J. Righton secretary. Exhibits are solicited from all the nations of the world. The imports of New Zealand last year, with its population of 850,000, were valued at £13,292,000, those from the United States being £1,528,000. All exhibits of heavy machinery or machinery in motion will be confined to a special building set aside for that purpose. Applications for space may be made to the Agent-General for New Zealand, Westminster Chambers, 13 Victoria street, London, E. C., or to the Secretary, New Zealand International Exhibition, Christchurch, New Zealand.

The main offices of the American Steel Foundries will be removed from New York to Chicago some time in October. The executive department of this company has already established offices in the Fisher Building and it is probable that the remaining offices will be located in the Star Building. Owing to the location of the larger foundries of the company in the West it has been deemed advisable to locate the main offices in Chicago.

The capacity of the plate glass factories of the country is said to be about 40,000,000 feet annually. Of this the Pittsburgh Plate Glass Company can produce 25,000,000 feet and 15,000,000 feet can be made at the plants of the nine independents. The yearly consumption has not exceeded 30,000,000 feet and in some years the importations have been large.

## New Publication.

**The Crystallization of Iron and Steel.** An Introduction of the study of Metallography. By J. W. Mellor. 12mo. Pages, 144. Illustrations, 65. Longmans, Green & Co., London and New York. Price, \$1.60 net.

The author has reproduced in this volume a course of six lectures delivered to the engineering students of the Staffordshire County Technical Classes, at Newcastle, in November and December, 1904. Some points of contact appear in the book with "Iron, Steel and Other Alloys," brought out in 1903 by Henry M. Howe, both giving more space than any other writers on the metallic alloys to the important contributions of metallography. The microscope has made plain many phenomena of heat treatment and mill manipulation that before were mysterious and regarded as practically unexplainable. Mr. Mellor's six lectures take up in order "Solidification and Cooling of Alloys," "Constituents of Iron and Steel," "Hardening, Annealing and Tempering of Steel," "Crystallization of Iron and Steel," "Influence of Stress and Strain" and "How to Prepare a Specimen for the Microscope." Perhaps the second and third contain the largest amount of practically important matter. The theory on which the chapter on the constituents of steel is based is that announced by H. C. Sorby in 1864 in noting the analogy between the constitution of steel and of a crystalline igneous rock.

In referring to the important modifications in the structure and properties of steel and cast iron due to the rate at which the metal is cooled from a high temperature the author lays stress on the useful information obtained from a microscopic study of the metal, that can be had in no other way. Yet this knowledge gained by the microscope is spoken of as not supplanting but rather supplementing the results of chemical analysis and of the mechanical and physical tests. Mr. Mellor suggests the possibility that in the near future specifications will be made out for steel with stated amounts of sorbite, pearlite, ferrite, &c., when certain specified properties are required. A metal with a large amount of sorbite is particularly tenacious and metallurgists have therefore investigated the best heat treatment for retaining a maximum of sorbite in the specimen. Thus "sorbite steel rails" are called for and we hear of "patented wire" alloys which through special treatment are given a large percentage of sorbite.

The book has a good index and its 22 pages of glossary, based on the report on the nomenclature of metallography drawn up in 1901 by the Iron and Steel Institute, is a valuable feature. In view of the increasing study of metallography and the more common recourse to it for the solution of every day problems in the handling of steel alloys the volume promises to be widely useful.

That automobile delivery wagons are capable of covering long distances over hard roads is demonstrated in an interesting run made recently by E. F. Von Wettberg of the Motor Express Company, Saginaw, Mich., in a new car just purchased. It was a regular stock model B delivery wagon of one ton capacity, built by the Rapid Motor Vehicle Company, Pontiac, Mich., and was equipped with Firestone tires and a Kingston carburetor. The run was made from Pontiac to Saginaw, a distance of 83 miles, in eight hours. Much of the way the roads were in bad condition. It was necessary to pass through mud, sand and water, in some places at least 6 inches deep. When the car reached Flint it was found that the bridge across the river was closed, leaving a choice of fording the river or taking a roundabout course, which would have added about 14 miles extra travel. It was decided to try the first alternative. With a flying start the machine managed to reach the middle of the river, where it stopped and had to be hauled out with a rope. The machinery was in no way damaged, and after cleaning the water from the carburetor and other parts where it would cause trouble the car proceeded to the end of its journey without further mishap.

## Rolling Lift Bridges and Multiple Tracks.

During the past ten years traffic has increased on some railroads so rapidly as to require first double tracks, then four tracks and now in some cases six tracks. These railroads are now very prominent, but their experience in developing increased traffic will be common in a large degree to all of the single track railroad lines of the United States. All of them will have to increase the number of their parallel tracks to accommodate their increasing traffic. It is safe to predict that the existing railroad traffic will be doubled in the next 12 years and that this ratio of increase will continue for decades to come.

A prominent feature connected with the handling of increasing traffic and the construction of the additional parallel tracks required is the extensive removal of single and double track center pier swing bridges and their replacement with Scherzer rolling lift bridges, built by the Scherzer Rolling Lift Bridge Company, Chicago. One of the inherent limitations of the center pier swing bridge is the fact that it cannot be enlarged or widened to accommodate additional tracks. It must always be discarded and removed at a great loss, also disarranging traffic, for if a new swing bridge were constructed alongside of an existing swing bridge it would be impossible to operate either of them because they interfere with each other. This difficulty is overcome by the Scherzer bridge, which can be constructed as a single track structure and be enlarged to a double or multiple track structure at any time without interfering with the existing bridge or disturbing the existing traffic by simply adding the new bridges alongside of the existing structure.

Some of the notable Scherzer bridges constructed and under construction to replace center pier swing bridges in this movement to accommodate increased traffic and additional parallel tracks are as follows:

The four-track bridge for the Metropolitan Elevated Railway Company, Chicago; the eight-track bridge, Chicago, used by the Pennsylvania lines west of Pittsburgh, the Chicago Terminal Transfer Railroad, the Chicago Junction Railroad and the Baltimore & Ohio Railroad; the six-track bridge at the entrance to the South Terminal Station, Boston; the four-track bridge used by the New York, New Haven & Hartford Railroad Company at Bridgeport, Conn., replacing a double track swing bridge. There are now also under construction for the last named company four-track Scherzer bridges at Cos Cob, Conn.; Westport, Conn., and over the Housatonic River, Connecticut, and over the Neponset River, Massachusetts. A large number of single and double track rolling lift bridges have been built in addition to those enumerated above. Six-track Scherzer bridges are also to be constructed across the Bronx River and across the Hutchinson River, New York, replacing four-track swing bridges. A double track Scherzer bridge has been placed in service recently for the Southeastern & Chatham Railway Company, England, across the Swale River, England, and another is nearing completion across the Suir River, Ireland, for the Fishguard & Rosslare Railways. A three-track Scherzer bridge is under construction for the Dutch State Railways, Holland, and a double track Scherzer bridge is under construction for the Buenos Ayres Great Southern Railway across Riachuelo River, Buenos Ayres, replacing a center pier swing bridge. The more than 40 Scherzer bridges already constructed for the use of electric railway companies have nearly all been constructed as double track and multiple track structures. They can readily be enlarged at any future time to accommodate increasing traffic and additional tracks without disturbing the existing bridges or traffic.

Plans are being made by the Pittsburgh Coal Company with the object of doubling its coke output next year. The company now operates between 700 and 800 coke ovens, and plans are under way for the building of about 500 new ovens, which will be located near Redstone, in the lower Connellsville region.

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# HARDWARE

THE trade will learn with profound satisfaction that the order issued by the Post Office Department directing the numbering of boxes on the rural routes and the delivery of mail addressed to such boxes by number without the name of the party for whom it is intended has been temporarily suspended. This action is gratifying and encouraging for more than one reason. It indicates the advantage the trade, and especially the Hardware trade, possesses in the fact that through its organization protests have been sent in in multitudes in accordance with the suggestion contained in *The Iron Age* of last week, such protests coming from the officials of State and national organizations, from local associations and from many individual merchants and manufacturers. The machinery of the trade was thus promptly put into motion for the prevention of serious injury to established commercial interests.

The action taken by the Washington officials is, however, to be regarded with especial satisfaction because it indicates that the Post Office Department has not broken with its past record of wisdom and conservatism in protecting the retail merchants from an unreasonable use of postal facilities by the catalogue houses. Notwithstanding the great influence which such houses possess, and the persistency and insidiousness of their working to secure whatever they can in the way of postal privileges, the action of the Department shows that it does not intend to permit the smaller merchants to suffer by an arbitrary, if not an illegal, exercise of its authority. In this connection it should be remembered that the Department has shown a judgment and consistency which cannot be too highly commended, for its determination to prevent its machinery from being worked to the detriment of the trade at large, and for forbidding its postmasters and carriers to become tools of the great mail order houses. The decision, even in the absence of the Postmaster-General, that the order issued by the Fourth Assistant is of so questionable propriety that it must for a time at least be held in abeyance manifests the spirit of the Department and should be regarded with unqualified approval. When the matter comes to the attention of the head of the Department, as it unquestionably will, we trust it will be finally decided in accordance with the broad and businesslike policy which characterizes his administration.

In order, however, that the Department and the Postmaster-General may understand the real bearings of the order and the great mischief that would be done to the retail interests in every department of business it is proper that protests should continue to be sent in from merchants and representative commercial bodies in every line of trade. The fact that the friends of existing commercial methods of distribution have succeeded in securing a suspension of the order does not do away with danger. They have been successful in a skirmish, but the battle is still to be won.

The report of the meeting of the Joint Catalogue House Committee which is given on another page will be read with interest. It will be seen that the committee is taking measures to carry on its work more aggressively than heretofore and to make it uncomfortable for manufacturers who do not meet its views. This determination touches upon a policy which will naturally be variously regarded and which if unwisely carried out, as it easily might be, would tend to complicate further a difficult situation. Very much will depend on the spirit and manner in which this course of procedure is put into effect. The trade certainly, while in entire sympathy with the aims of the committee, would deprecate anything suggestive of a black list or wearing the color of a boycott.

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## Condition of Trade.

The closing week of September witnesses a most satisfactory condition of business as the favorable elements in the situation to which we have referred continue without interruption. The advance of the season is naturally bringing with it an increasing volume of trade and manufacturers, jobbers and retailers are as a rule well occupied with the demands made upon them by their customers. Many manufacturers indeed report that the orders placed with them during the past two months are sufficient to tax their capacity and prevent them from making prompt shipment of current orders. The indications thus point to a large volume of business and in a good many lines to more or less difficulty in obtaining goods. Under these circumstances the jobbers who have purchased freely and have entered the season with ample stocks will enjoy an advantage in the market. In the matter of price the market is decidedly firm. Recent advances in Wire and Wire products and other heavy goods are being firmly maintained and are being followed by other advances in various lines. Export trade continues to be of growing volume, notwithstanding obstacles in some directions, as, for example, in China, where the boycott of American goods is a serious matter for those interested in that field. Whether or not the reports are correct that the boycott has been removed remains to be seen, there being a feeling on the part of many that while it may be abandoned technically it will still remain to a good extent in practical force on account of the prejudice of the people, which is not to be dissipated by formal resolutions or official decrees. The Russian market is receiving special attention, and manufacturers are beginning to feel the beneficial effects of the withdrawal of the supplementary duties which have been in force for several years. All the indications point to an important increase in Russian trade. On the whole, the export business is in a very promising condition and the indications point to a large increase in the foreign trade of the country in Iron, Hardware and related lines.

**Chicago.**

September business already promises to eclipse that of August, which was the largest month in the history of most of the local jobbing houses. Business thus far this month shows a big increase over the corresponding month last year, and September, 1904, was one of the largest months in the history of the trade. Seasonable goods, such as Corn Huskers, Corn Knives, Potato Forks, Stove Boards, Elbows, Pipe, &c., are in big demand and the movement is almost unprecedented. The demand for Stoves is also very heavy and in a few instances filling in orders have already been received. On account of the recent advances in raw material some manufacturers of Hardware goods have announced higher prices. Bolts, Machine Screws, Cast Iron Goods, Thimble Skeins, Sash Weights and Jack Screws are very firm. Advances in all classes of Brass Goods are also anticipated. There have been recent advances in Copper Goods on account of the high ruling prices of the raw material. Copper Boilers, Sheet Copper, Rivets and Burrs and even Tin Boilers with Copper bottoms have been slightly advanced in the last ten days. Demand for Builders' Hardware continues heavy, local houses now figuring on the Hardware equipment for five large buildings in course of erection here. Deliveries on practically all classes of Builders' Hardware are delayed from one to two months, and it is extremely doubtful if manufacturers will be able to catch up on their deliveries before the winter months. Demand for all Wire Products and Wire Nails continues heavy and jobbers are experiencing much difficulty in keeping up their stocks. Since the recent advance there has been an entire lack of speculative buying of Fence Wire such as usually follows a period of depression and the immediate stiffening and advance in prices. Wire Nails are decidedly firm.

**NOTES ON PRICES.**

**Wire Nails.**—Demand during August and thus far in September has been exceptionally heavy. Retail merchants are buying freely. Prompt deliveries from mills are being somewhat interfered with by the difficulty experienced in obtaining steel; also by the shortage of cars. It is understood that an advance has been made in the price of Wire Nails and Wire products in what is known as the Texas territory, which includes Texas, Oklahoma and Indian Territory. This is a disputed district, where Southern and Western competition is particularly keen and where Northern mills seek an outlet for their product during dull seasons. This advance is a distinct sign of improvement in the Wire and Wire Nail market. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads to jobbers.....\$1.75  
Carload lots to retail merchants..... 1.80

**New York.**—Local demand continues in good volume and the market is firm. New York quotations for small lots from store are on the basis of \$1.95 to \$2.

**Chicago.**—The tonnage of Wire Nails placed during the month of August exceeded that of any other month in the history of the Wire Nail trade. Despite this heavy buying the tonnage placed thus far this month exceeds that placed during the same period last month. The movement from jobbers' stocks is unusually large, and they are experiencing great difficulty in securing mill shipments to keep up their assortment of sizes. Official prices are unchanged and are as follows: \$1.90 in car lots to jobbers, \$1.95 in car lots to retailers, with 5 cents advance for less than car lots from mill.

**Pittsburgh.**—Mills report very satisfactory conditions in the Wire Nail market, the demand steadily increasing, while prices as recently fixed by the leading interests are being rigidly held. The mills are having more or less trouble in getting prompt deliveries of Steel and the scarcity of cars is also seriously interfering with shipments. All indications point to a heavy fall trade and jobbers have bought very freely in anticipation of this. We quote Wire Nails at \$1.75 in carloads to the largest

jobbing trade, which is the absolute minimum of the market, and \$1.80 in carloads to retailers, f.o.b. Pittsburgh, plus actual freight to point of delivery, terms 60 days, less 2 per cent. off for cash in 10 days.

**Cut Nails.**—At the meeting of the Cut Nail Association held September 26 no advance was made, but \$1.65, base, was decided upon as the selling price. Whether mills outside the association will maintain this price is uncertain, but those in the association are expected to do so. Mills are already pretty well sold up, as the anticipation of higher prices has induced the placing of orders. Quotations are as follows: \$1.65, base, for carload lots, f.o.b. Pittsburgh. Iron Cut Nails for delivery at Pittsburgh, Buffalo and all points West of these cities are held at about \$1.70, base, in carload lots.

**New York.**—The demand in the local market has shown some improvement, especially for Flooring and Shingle Nails. Quotations for small lots from store are on the basis of \$1.90.

**Chicago.**—The improvement in the Wire Nail market has been reflected in Cut Nails, and Steel Nails in large lots to jobbers, f.o.b. Chicago, are firmly held at \$1.75, base. The movement of Nails has also improved considerably and still further improvement is anticipated. Car lots to retailers are quoted at \$1.80, base, and less than car lots, from mill, \$1.90, base; small lots from store, \$2, base.

**Pittsburgh.**—The Cut Nail Association held a meeting September 26, at which no advance in prices was made, but the price at mill was fixed at \$1.65, base. For some time prices of Cut Nails have been relatively low, based on cost of Steel, and the mills are well filled up with business. Jobbers have placed orders quite freely in the belief that prices would be advanced and the Cut Nail mills have more orders on their books than for some time. We quote Cut Nails \$1.65, base, in carload lots, f.o.b. Pittsburgh, an advance of 10 cents per keg being charged for Iron Cut Nails.

**Barb Wire.**—While leading jobbers have quite generally provided for their future requirements by placing contract orders with mills, new business continues quite satisfactory. The fall demand from consumers is expected to be very large. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

|  | Painted. | Galv.  |
|--|----------|--------|
| Jobbers, carload lots.....             | \$1.90   | \$2.20 |
| Retailers, carload lots.....           | 1.95     | 2.25   |
| Retailers, less than carload lots..... | 2.05     | 2.35   |

**Chicago.**—While the fall demand for Barb Wire is always below spring requirements, tonnage placed thus far is very heavy and jobbers report a good movement from stock. Official quotations are as follows: To jobbers, Chicago, car lots, Painted, \$2.05; Galvanized, \$2.35; retailers, car lots, Painted, \$2.10; Galvanized, \$2.40; retailers, less than car lots, Painted, \$2.20; Galvanized, \$2.50; Staples, Bright, in car lots to jobbers, \$2; Galvanized, \$2.30; car lots to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

**Pittsburgh.**—New orders being entered by the mills are quite satisfactory and the leading jobbers have pretty well covered their requirements for some time ahead. The fall trade is expected to be very large, and we are advised that the mills are making shipments as rapidly as possible in view of a possible congested condition owing to shortage in supply of cars. The mills are also having some little trouble in getting prompt deliveries of Steel. We quote Painted Barb Wire at \$1.90 and Galvanized at \$2.20 in carload lots to the large jobbing trade, with the usual advance of \$1 a ton to retailers in carload lots, f.o.b. Pittsburgh, 60 days, or 2 per cent. off for cash in 10 days.

**Smooth Fence Wire.**—The business placed with mills continues large in anticipation of a heavy demand for Wire Fencing. Shipments are somewhat delayed by a shortage of cars. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

|                          |        |
|--------------------------|--------|
| Jobbers, carloads.....   | \$1.60 |
| Retailers, carloads..... | 1.65   |

The foregoing prices are for base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

|                      | 6 to 9 | 10  | 11  | 12  | 12½ | 13   | 14   | 15 | 16 |
|----------------------|--------|-----|-----|-----|-----|------|------|----|----|
| Annealed.....Base    | \$0.05 | .10 | .15 | .25 | .35 | .45  | .55  |    |    |
| Galvanized....\$0.30 | .35    | .40 | .45 | .55 | .65 | 1.05 | 1.15 |    |    |

**Pittsburgh.**—Prices recently fixed by the leading interests are, we are advised, being rigidly held. Tonnage is increasing steadily and the outlook for a heavy fall trade is very good. There is some delay in shipments by the mills, owing to shortage in cars. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

|                          |        |
|--------------------------|--------|
| Jobbers, carloads.....   | \$1.60 |
| Retailers, carloads..... | 1.65   |

The above prices are for base numbers, 6 to 9.

**Chicago.**—Independent Fence manufacturers have placed large contracts with the leading interest for Wire in anticipation of the big fall demand for Fencing. The tonnage of Smooth Fence Wire placed thus far this month exceeds that of the same period in August, which is unusual, inasmuch as the month of September is usually a quiet one in the Fence Wire trade. Quotations to jobbers, f.o.b. Chicago, in car lots, \$1.75; to retailers, car lots, \$1.80.

**Axes.**—An important and decidedly interesting meeting of the Axe Manufacturers' Association was held in this city last week. One of the questions considered was whether prices should be advanced in accordance with the expectation of the trade, encouraged by intimations from some at least of the manufacturers. Such action, too, would have been in entire accord with the general policy of the management of the combination under which the manufacturers are working together and endeavoring to control the market. As the result of protracted discussion and not a little difference of opinion prices were reaffirmed, leaving quotations as follows:

|                                    |                      |
|------------------------------------|----------------------|
| Single Bit Axes, base weights..... | Per dozen.<br>\$6.75 |
| Double Bit Axes.....               | 8.75                 |

with the same rebates to jobbers on the classified lists as heretofore. There is reason to believe that the association was pretty evenly divided on the question as to the advisability of putting up prices, and at one time it looked as if this might be done. Some of those opposed to this action have expressed themselves as taking this position because it would be simply for the advantage of the jobbing trade, who have already purchased their supplies and who would in all probability be enabled by this action to cut prices so as to undersell the manufacturers. The entrance into the market of competition, which may be formidable, undoubtedly had its influence also in deciding the manufacturers to take a conservative course.

**Sash Weights.**—The Sash Weight market feels the effect of the advance in iron and higher prices are being named by the associated and generally by outside manufacturers. The following are given as representing the official quotations of the leading manufacturers, who are working together with a good degree of harmony:

|                         |                 |
|-------------------------|-----------------|
| Eastern .....           | \$27.50 to \$28 |
| Southern .....          | 20.00 to 23     |
| Western and Middle..... | 23.00 to 25     |

These prices are shaded more or less freely to the trade.

**Wagon Skeins.**—An advance of something like 10 per cent. has been made in the price of Wagon Skeins. This action has been taken in view of an excellent demand and the increasing cost of the raw material. The market in a general way is represented by a discount of from 80 to 80 and 10 on the Cast Iron and of from 40 to 40 and 10 on the Steel. There is not, however, entire uniformity in current quotations.

**Scythes.**—The market for these goods is under almost complete control of the manufacturers, and the recently advanced prices are being maintained. Intimations, indeed, are given out that a further advance may be made before the close of the year. Some interest is expressed in the trade as to the success of the somewhat complicated and detailed arrangement now in force in regard to the payment of bills and the discount or abatement given for prompt remittances for goods purchased.

**Jack Screws.**—An advance of about 10 or 12½ per cent. has been made in the price of Jack Screws, which is now represented by the quotations of from 80 to 80 and 10 per cent. discount.

**Wire Rope.**—As the result of the higher prices ruling for Wire an advance has been made in the price of Wire Rope, quotations to consumers being now as follows:

|                              |               |
|------------------------------|---------------|
| Plain (Bright or Black)..... | .45 and 2½%   |
| Galvanized .....             | .37½ and 2 %. |

**Forks, Hoes, &c.**—The American Fork & Hoe Company, in connection with its new catalogue, to which we have already directed attention, is announcing its quotations for next year. The prices are substantially the same as they have been, with changes on a few articles, mostly in the way of correcting inequalities and errors. The company's general method of quotation is substantially the same as before, a long series of complicated discounts being used. While list prices as a rule are without important change, a new list has been adopted on Handles for Forks, Hoes and Rakes.

**Holdback Screen Door Hinges.**—The market on these goods has developed a good deal of irregularity. The selling arrangement which has existed has been discontinued and the market is an open one, with the prospect that there will be a good deal of animated competition between the manufacturers.

**Bright Wire Goods.**—The market for this line shows no special improvement since our last report. Prices continue low at about 90 and 40 per cent. discount to fair retail trade, with no appreciable tendency to participate in the advancing trend of other Hardware products. This is due in part to technical conditions affecting production, some manufacturers turning out more or less complete assortments of Bright Wire Goods as a side line, thus using up odds and ends of stock and employing idle hands. Sharp competition, however, is undoubtedly the primary cause of the low prices, for the line is frequently used as a wedge in securing orders for more profitable goods of similar nature which by common consent have been kept out of this classification. It is often the case that orders for Bright Wire Goods are not solicited because of the unprofitable prices, but where called for they are supplied at the ruling discounts in order to hold trade or make up shipments. The condition of affairs is deplored by the manufacturers, but past efforts to correct it have failed with discouraging uniformity.

**Conductor Pipe and Eaves Trough.**—A meeting of the National Conductor Pipe Association was held last week in the city of Cleveland. No important changes were made in the schedule of discounts of July 3, which was given in full in these columns. The market is in a highly satisfactory condition. The association is gaining in membership and outside manufacturers show no disposition to disturb the established prices.

**Rope.**—The continued strong and advancing market for Manila and Sisal Hemp has strengthened the Rope market, and concessions from card prices have been withdrawn by some manufacturers. It is reported that manufacturers have agreed to maintain card prices. The stronger market has quickened demand considerably, which had been moderate on the former weak Hemp market. Quotations on the basis of 7-16-inch diameter and larger are as follows: Pure Manila, 12 cents; Pure Sisal, 10 cents; No. 2 quality Sisal, 8 cents per pound.

**Window Glass.**—The majority of the Glass factories now in operation are working under the flat scale of wages. A small number of factories are trying to operate under the sliding wage scale, most of which are making little headway. Manufacturers who favor the sliding scale are reported as being determined to operate under the sliding scale, or in the event of being unable to do this to let their plants stand idle. The approach of cooler weather has improved demand in the local market.

**Linseed Oil.**—The market is in an unsettled and unusual condition. There has been and still is a scarcity of Oil and full prices had been secured until the safety of the unusually large crop of Flax Seed was practically assured. Futures were then sold on the basis of Raw at 40 to 42 cents per gallon, while spot Oil was bringing 54

cents per gallon. The price then dropped to 35 cents for contract Oil, at which a large quantity was sold, some up to July 1, 1906. Crushers now do not care to book orders for delivery beyond March, as they are uncertain what the foreign demand for Cake and Meal will be in the spring. At present the demand is good and prices remunerative, but if conditions should change crushers would be obliged to advance the price of Oil. Prices for spot Oil now range from 40 to 54 cents for Raw, according to sellers, a limited number only selling at the former figure. Buyers are purchasing only enough for present requirements, until new Oil reaches the market, which it is not expected to do in large quantity much before the second or third week in October.

**Spirits Turpentine.**—Unfavorable weather and scarcity of labor in the Turpentine district, with receipts somewhat reduced by the yellow fever and a good export demand, have all tended to strengthen the Southern market and advance prices. The local market has been quiet, with a limited demand at the higher values. New York quotations are as follows, according to quantity: Oil barrels, 66½ to 67 cents; machine made barrels, 67 to 67½ cents.

## WHOLESALE AND RETAIL HARDWARE JOINT COMMITTEE.

(By Telegraph.)

ON Monday, 25th inst., the members of the Wholesale and Retail Hardware Joint Committee met in St. Louis, at the Hotel Jefferson, for the consideration of various matters relating to their special interests. The attendance was a large and thoroughly representative one.

Many secretaries of Hardware and other trade organizations throughout the country are also in St. Louis for the purpose of attending the general conference on Wednesday and Thursday called for the purpose of taking united action if possible in regard to mail order and catalogue house competition as well as parcels post legislation.

The Joint Committee re-elected the former officers for the ensuing year, including S. Norvell, St. Louis, chairman, and T. James Fernley, Philadelphia, and M. L. Corey, Argos, Ind., secretaries. A new office, that of vice-chairman, was created, and E. M. Bush, Evansville, Ind., vice-president of the National Retail Hardware Association, was elected to that position.

The following committees were appointed, the chairman of the Joint Committee being an ex-officio member of each committee:

COMMITTEE No. 1—SPORTING GOODS: W. P. Bogardus, chairman; S. R. Miles, W. S. Wright, R. A. Kirk.

COMMITTEE No. 2—TO INVESTIGATE PRICES QUOTED BY CATALOGUE HOUSES: M. L. Corey, chairman; R. A. Kirk, E. M. Bush, S. R. Miles, W. S. Wright, C. B. Carter, T. James Fernley.

COMMITTEE No. 3—TO CORRESPOND WITH MANUFACTURERS AND OTHERS SELLING TO CATALOGUE HOUSES: T. James Fernley, chairman; M. L. Corey, R. M. Dudley, C. B. Carter, W. S. Wright, R. A. Kirk, W. P. Bogardus, S. A. Bigelow.

COMMITTEE No. 4—TO TAKE UP THE CATALOGUE HOUSE QUESTION WITH RETAIL TRADE: M. L. Corey, chairman; T. Frank Ireland, S. R. Miles.

COMMITTEE No. 5—TO TAKE UP CATALOGUE HOUSE QUESTION WITH JOBBERS: T. James Fernley, chairman; R. A. Kirk, W. S. Wright.

COMMITTEE No. 6—ON PRESS AND PUBLICITY: T. James Fernley, chairman; M. L. Corey, C. B. Carter.

COMMITTEE No. 7—TO CORRESPOND THROUGH JOBBERS WITH THE RETAIL TRADE IN THE SOUTH ON THE CATALOGUE HOUSE QUESTION: C. B. Carter, chairman; R. M. Dudley, M. L. Corey.

The committee took up in definite and practical form measures to be adopted in connection with their efforts to relieve the trade from the troublesome competition of catalogue houses, and at all the sessions of the committee important matters were considered and acted upon.

### Telegrams to Manufacturers.

In the view of the committee manufacturers are divided more or less definitely into those favorable to their plans and those unfavorable. Telegrams and letters

were sent to a number of manufacturers expressing the appreciation of the committee of their co-operation in the work, either in refusing to sell catalogue houses altogether or in controlling prices at which their goods are quoted. Other telegrams and letters were sent to those from whom a more hearty co-operation is desired than has yet been given. These telegrams were in accordance with the determination of the committee to carry on their work with more definiteness and to inform the trade specifically as to the attitude of manufacturers, whether favorable or unfavorable. The general tenor of these telegrams is represented by the following:

*Can we expect any relief from demoralization caused by unprofitable prices on your goods still quoted by catalogue houses? Kindly wire reply, care Hotel Jefferson.*

The replies received naturally had careful attention.

### The Rural Letter Box Order.

Consideration was given to the order of the Fourth Assistant Postmaster-General published in full in *The Iron Age* of last week. The gravity of the situation was recognized and action was taken with a view to having the order modified or withdrawn altogether.

### An Aggressive Campaign.

A gratifying report was made that recent mail order catalogues contain advances in price on many standard goods in the Hardware line, while those of prominent manufacturers are in some cases entirely omitted.

It is intended to make the catalogue house question a prominent one at the Washington convention, where the question will be discussed by the manufacturers, jobbers and retailers. In this way it is intended to bring before the entire trade actual facts and figures, probably in specific form, giving information as to the actual position of many leading goods in which catalogue house competition is most troublesome. With a view to having this subject covered fully and accurately it was decided that the secretaries should obtain definite information previous to the convention regarding the position of certain manufacturers on the catalogue house question. The committee decided to publish soon after the Washington meeting, for distribution to the entire jobbing and retail trade of the country, a pamphlet giving in detail the attitude of every favorable and unfavorable manufacturer and jobber on this question.

Action was taken by the five officers present of the National Retail Hardware Association affirming the resolution of this association at its last annual meeting in Minneapolis indorsing the work of the Catalogue House Committee and recommending the retail Hardware merchants of the country to show their appreciation of the support thus received from manufacturers and jobbers by giving such manufacturers and jobbers the preference in the buying of their goods.

### Other Subjects of Discussion.

There was a good deal of discussion as to the direct sources of supply of catalogue houses on certain lines of goods, whether from manufacturers or from jobbers.

Regret was expressed that the question of private brands should have been injected into the discussion of catalogue house competition.

Believing that the catalogue house question can be most successfully handled by associated effort, the committee strongly urged all jobbing and retail merchants to join associations and co-operate in the work.

The committee indorsed the pamphlet which is being prepared by the Southern Hardware Jobbers' Association on catalogue house competition for distribution throughout the Southern trade.

Action was taken with a view to securing the more active co-operation in this movement of traveling salesmen in all lines. Indorsement was also given of the work in progress in uniting the efforts of associations in every line of mercantile business on the catalogue house question. Expression of appreciation was made of the large attendance and interest and enthusiasm shown by the secretaries of various organizations who are in St. Louis to attend the conference referred to below.

Appreciation was expressed of the fair treatment re-

ceived generally from the trade press of the country in the discussion of the catalogue house question.

It was determined that the official year of the committee should expire on the first Monday in July of each year.

The meeting was characterized by entire harmony and the best of feeling prevailed throughout all the discussions and deliberations.

## MEETING OF ASSOCIATION SECRETARIES.

(By Telegraph.)

THE secretaries of Hardware and other associations throughout the country are in session as we go to press and their proceedings will probably extend over Thursday. They have come together in response to the invitation of T. James Fernley, secretary of the Joint Committee, for the purpose of taking united action on the catalogue house question. Action will also be taken with a view to following up the temporary suspension of the recent post office order concerning rural free delivery and insisting on an investigation as to the cause of the issuance of the obnoxious order. One-cent letter postage and parcels post legislation will also come up for serious consideration.

Among the secretaries who are taking part in the deliberations are the following:

- J. H. Drury, National Supply & Machinery Dealers' Association, Cleveland, Ohio.
- C. B. Carter, Southern Hardware Jobbers' Association, Knoxville, Tenn.
- A. R. Sales, Iowa Retail Hardware Dealers' Association, Mason City, Iowa.
- C. A. Peck, Wisconsin Retail Hardware Association, Berlin, Wis.
- Henry Othmer, Wholesale Saddlery Association, Chicago, Ill.
- M. L. Corey, National Retail Hardware Association, Argos, Ind.
- J. D. Green, Albany, N. Y.
- Henry Leudinghaus, National Wagon Manufacturers' Association, St. Louis, Mo.
- Frank Parry, Millers' National Association of the United States, Washington, D. C.
- Thomas J. Hogan, National Association of Stove Manufacturers, Chicago, Ill.
- E. C. Hanrahan, Chicago, Ill.
- Paul Blatchford, Central Supply Association, Chicago, Ill.
- Douglass Dallam, Wholesale Dry Goods Association, New York City.
- A. W. Williams, Ohio Valley Association, Columbus, Ohio.
- C. N. Barnes, North Dakota Retail Hardware Association, Grand Forks, N. D.
- F. Neudorff, Missouri Retail Hardware Dealers' Association, St. Joseph, Mo.
- W. T. Grosser, Salina Commercial Club, Salina, Kan.

THE T. T. MILLER HARDWARE COMPANY, Easton, Pa., has issued a pamphlet containing "handy trade price-lists" of Cut and Wire and Miscellaneous Nails, Iron and Brass Wood Screws, Carriage and Tire Bolts, Strap and T Hinges and Files. The pamphlet is intended for distribution generally to the trade, especially to the company's customers.

Wilson & Son have succeeded to the Hardware business of George S. Wilson, Berlin, Iowa. They will carry a stock of Shelf Hardware, Stoves and Tinware, Agricultural Implements, Paints and Oils, Wagons and Buggies.

C. W. Marquardt has succeeded Marquardt & Schoeneck, Scribner, Neb., in the retail Shelf and Heavy Hardware, Stove and Tinware, Agricultural Implement, Paint, Oil, Sporting and Athletic Goods business.

William H. H. Weston, Plymouth, Mass., has sold his Hardware and plumbing business in that place to John E. Jordan, who has been associated with him for 35 years.

Hobart Goodale, Bristol, Conn., has removed his Hardware business to new quarters, where he will discontinue his department of Tinware.

## TRADE WINNING METHODS.

*This department is for the description of approved methods of carrying on and extending business, and a cordial invitation is given to merchants to co-operate in the effort to make it suggestive and of practical use to the trade.*

### HARDWARE IN BATTLE ARRAY.

ON the occasion of a local reunion H. T. Payne of the McMillan-Payne Hardware Company, Aberdeen, Miss., constructed for store display the battle ship

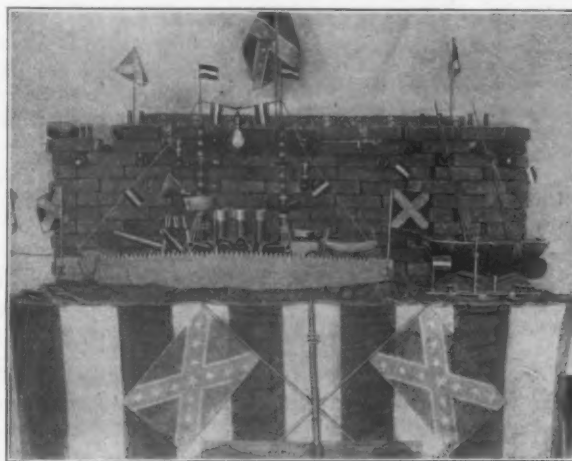


Fig. 1.—Battle Ship Under Guns of Fort.

and fort shown herewith. Fig. 1 represents the man-o'-war as lying under the guns of the fort with a coast defense monitor and what appears to be a captured prize. A separate and larger view of the ship is given in Fig. 2. The hull was made of two 4½-foot Cross Cut Saws; three Chimneys formed the funnels and the masts were constructed of different sizes of Spool Wire. A Dipper made one fighting top and a Mouse Trap a turret. Faucets represented the big guns, Pipe Elbows the ventilators and a Corkscrew the anchor. Other goods entering into the construction were Buggy Boxings, Couplings and

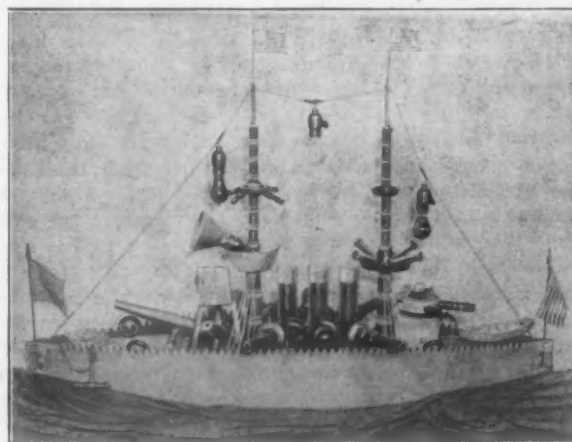


Fig. 2.—A Hardware Battle Ship.

Nipples, Stone Jar, Hair Curler Heaters, Toaster, Funnel, Pot Bracket, Leather Valve, Lead Pencils, Curtain Rings, &c. The ship was lighted by electricity and carried six incandescent bulbs. Mr. Payne, the constructor of the battle ship, advises us that he is prepared to furnish photographs of the exhibit with list of articles employed and full directions how to construct for \$1 each.

THE eighth annual convention of the Iowa Retail Hardware Dealers' Association will be held at Des Moines on February 14, 15 and 16 next.

## AMONG THE HARDWARE TRADE.

E. S. Barger, Smith Center, Kan., has sold his Hardware, Stove, Tinware and Sporting Goods business to E. W. Luse.

The retail Hardware business of Fred. John & Co., Roland, Iowa, has been sold to E. A. Cole.

The Iowa Hardware Company has bought the business of F. M. Danner, Murray, Neb.

It is reported that a new Hardware store is being built in Salisbury, Md., which will be operated by a company now forming with a capital of about \$25,000.

J. H. Dauer has succeeded Dauer & Hoggan, Heyburn, Idaho, in the wholesale and retail business in Shelf Hardware, Paints, Sporting Goods, groceries, &c.

Auxter & Slemmer have bought Wm. Tarnutzer's Hardware, Stove, Implement and Paint business at Lindsey, Ohio.

Edward F. Smith has disposed of his Hardware, Stove, Implement and harness business at Keswick, Iowa, to R. L. Crawford, who continues at the old stand.

P. B. Prewitt has disposed of his half interest in the Hardware business of Elliott & Prewitt, Somerset, Ky., to W. A. Pettus, junior member of Pettus Bros., in the general mercantile business at Bryantsville, Ky. After October 1 the Somerset firm style will be Elliott & Pettus, who will continue to handle Heavy and Shelf Hardware, Stoves, harness, Paints, &c., as heretofore.

The Mammoth Spring Hardware Company, Mammoth Spring, Ark., has purchased the business of S. G. Palmer of that place. The new company will handle a general line of Shelf and Heavy Hardware, Stoves, Agricultural Implements, &c., and will carry on both a wholesale and retail business.

Hard & Kimball have opened an up to date Hardware store at Canton, Ill.

## WILLIAM H. HART'S GOLDEN WEDDING.

WILLIAM H. HART, president of Stanley Works, New Britain, Conn., with Mrs. Hart and 14 grandchildren, celebrated the fiftieth, or golden, anniversary of their wedding on Tuesday, September 19. The celebration was carried out on a large scale to accommodate the many business and social friends from nearby and distant places who were present to extend their congratulations. To supplement the house space available a large tent was erected on one of the lawns. There were many beautiful presents, handsome floral decorations, music and other accompaniments incidental to such occasions. Besides elegant gifts from the office force and from the foremen and heads of departments of the Stanley Works a loving cup was presented by the directors of the New Britain National Bank and a gold headed cane by the directors of the Young Men's Christian Association, with whose work Mr. Hart has been long and prominently identified. These and many other tokens as well as the whole spirit of the occasion indicated the very warm regard and high esteem in which Mr. Hart is held by all who know him.

THE NATIONAL SALES CORPORATION, 256 Broadway, New York, is the name of a newly incorporated concern of which Emil Grossman is president. Mr. Grossman is also secretary and general manager of the Continental Caoutchoucs Company, 43 Warren street, New York, which markets the Continental automobile tires (of European manufacture) in this country. The National Sales Corporation will act as factory sales managers and will market various automobile specialties.

## COMPACT BETWEEN ENGLISH AND GERMAN SCREW MAKERS.

THE negotiations between manufacturers of Screws in Great Britain and Germany, reference to which was made in these columns September 7, appear to have been consummated. The British Screw manufacturers are said to have perfected arrangements with the German makers by which after October 1 English orders for Screws will not be accepted by the German Syndicate, officially known as the United German Screw Works, which was formed in July last. On the other hand, British manufacturers, parties to the agreement, will not accept orders originating in Germany. All orders on hand must be executed by December 31. All the German works, with possibly one exception, are included in the compact. The agreement also includes in addition to English and German makers those in Switzerland, Italy and France, but not Belgium, the competition of the Belgians not being considered important. The contest between the English and Germans has long been forced by the English, who successfully sold their product in the German market, despite the German tariff wall, to such an extent that the German makers made the advances toward the agreement which is now said to have been perfected.

## HARDWARE MUTUAL FIRE INSURANCE.

THE WASHINGTON HARDWARE AND IMPLEMENT DEALERS' MUTUAL FIRE INSURANCE ASSOCIATION was organized in Spokane, Wash., on August 25. Articles of incorporation and by-laws have been drawn up, and as soon as the association gets its charter from the State it will be ready to do business. The officers of the association are W. P. Lucas, Davenport, Wash., president; C. A. Loy, Fairfield, Wash., vice-president; F. H. Shaw of Shaw-Wells Company, Spokane, Wash., treasurer, and E. W. Evenson, Spokane, secretary. The Board of Directors and the Board of Trustees have not as yet been fully decided upon, but they are being selected from among the best business men in the Inland Empire. This association is an outgrowth of the Inland Empire Implement and Hardware Dealers' Association.

The statement of condition, August 31, of the Retail Hardware Mutual Fire Insurance Company, of Minnesota, H. S. Mathews, secretary, Boston Block, Minneapolis, shows that the amount of insurance in force at that time was \$2,254,873, with total assets of \$60,105.21, an increase since January 1 of \$12,070.48, and net surplus, \$39,255.32, an increase of \$8,435.97.

We are advised that the Iowa Hardware Mutual Insurance Association is becoming very popular with the trade in Iowa and adjacent States. At a meeting of the Executive Committee held on the 22d inst. for the purpose of canvassing the quarterly business of the association plans were consummated for making a special effort to bring the Iowa association up to the fine standard reached by some of the older Hardware insurance mutuals. The association is now paying a cash rebate of 25 per cent. on stock company rates, and its officers express confidence that a substantial increase in the percentage of rebate will be made at the next annual meeting, in January, 1906.

THE DUBY & SHINN MFG. COMPANY, 19 Park place, New York, states that the delay in supplying the trade with the larger sizes of the new Universal Square has been due to the fact that when the company began the manufacture of the Square it did not know that a specially prepared steel would be necessary, and to make matters worse the company's order for the steel was placed at a time when the mills were taking stock and making repairs. This forced the company to wait more than two months for a supply. The company, however, has now completed a large number of all sizes and will soon be abreast of back orders and in a position to supply all demands.

## PRICE-LISTS, CIRCULARS, &amp;c.

Manufacturers in Hardware and related lines are requested to send us duplicate copies of catalogues, price-lists, &c., one copy for our Catalogue Department in New York and another for our London office; and at the same time to call our attention to any new goods or additions to their lines, of which appropriate mention will be made besides the brief reference to the catalogue or price-list in this column.

SARGENT & Co., New Haven, Conn., and 149-153 Leonard street, New York: Forty-page illustrated catalogue with matter in regard to Sargent's Gem Food Chopper, for Hardware merchants only. It is both descriptive and suggestive, containing display advertisements and hints for using, electrotypes of the ads. being sent to merchants gratis.

TRAGLE MFG. COMPANY, Reading, Pa.: Annual catalogue and price-list No. 7, illustrating a complete line of Veterinary Files and Floats.

CROWE NAME PLATE & ENGRAVING COMPANY, 71 West Jackson Boulevard, Chicago, Ill.: Enlarged illustrated catalogue devoted to Metal Name Plates, Engraved Signs, Tablets and Patterns, Sunken Letter Machine Plates, Metal Labels and Special Plates.

AMERICAN SLICING MACHINE COMPANY, 56 Fifth avenue, Chicago, Ill.: Illustrated descriptive catalogue of the American Slicing Machine, which is designed to cut cooked and dried meats, bread, cheese, &c., in slices as thin as paper or of 15 different thicknesses up to 1/2 inch, or thicker if required. It is principally used in delicatessen stores, by butchers, caterers, restaurants, in hospitals, steamships, &c.

KEYSTONE LOCK WORKS, E. T. Fraim proprietor, Lancaster, Pa.: Catalogue No. 16, illustrating and describing Pressed Steel, Wrought, Cast and Malleable Iron, Bronze, Brass, Nickel and Aluminum Padlocks and Night Latches. A number of additions to the line are shown.

SCHUCHARDT & SCHÜTTE, 136 Liberty street, New York: 40-page catalogue of high-grade Tools, including Pliers, Nippers, Pincers, Folding Rules, Hand Vises, Magnets, Cogged Scissors, Snips, Vernier Calipers, Needles, &c., in comprehensive variety.

THE HOPKINS & ALLEN ARMS COMPANY., Norwich, Conn.: Supplement to catalogue No. 2, 1902, devoted to Single and Double Barrel Guns, Rifles, Revolvers and Rustless Gun Grease.

BILLINGS & SPENCER COMPANY, Hartford, Conn.: Illustrated price-list of Drop Forged Machine Wrenches, embracing Milled, Semifinished and Finished Wrenches.

GEUDER & PAESCHKE MFG. COMPANY, Milwaukee, Wis.: Illustrated price-list relating to Enameled Ware, including American Blue and White, Cream City Gray and Opaline.

HAYDEN IMPLEMENT COMPANY, 46 Duane street, New York: Circulars illustrating and describing Easy Floor Cleaner, Felt Brush and Duster, Easy Floor Oilier, Felt Shoe Polishing Brush and Extension Pole Grip.

THE ALLEN IRON COMPANY, 36 Great Jones street, New York: Circular illustrating and describing Mrs. Allen's Glad Iron, which is heated with packages of prepared coal.

WALTER A. ZELNICKER SUPPLY COMPANY, St. Louis, Mo.: Eight-page pamphlet describing the Zelnicker hand shaved second growth handles.

MCCABE HANGER MFG. COMPANY, 425-427 West Twenty-fifth street, New York: Catalogue of Ball Bearing and Tubular Door Hangers, Overhead Carriers, Expansion Bolts and Ball Bearing Wheels, with price-list of parts.

THE GENEVA METAL WHEEL COMPANY, Geneva, Ohio: Illustrated price-list relating to Wagons and Implement, Truck, Wagon and Wheelbarrow Wheels.

OWOSSO MFG. COMPANY, Owosso, Mich.: Catalogue and price-list 1905-06, devoted to a line of Snow Shovels.

THE LUDLOW-SAYLOR WIRE COMPANY, St. Louis, Mo.: Special catalogue of Fly Screen Wire Cloth, Galvanized Hardware Cloth, Hexagon Netting, Screens, Riddles, Wire Flower Stands and Wire Trainers. The catalogue

contains a table showing the number of square feet in Screen Wire Cloth from 18 to 48 inches wide and 2 to 100 inches in length.

ISAAC CHURCH, 1521 Walnut street, Toledo, Ohio: Illustrated price-list of Expansion Bolts, of which a number of styles and sizes are shown.

WILLIAM JOHNSON, Hedenberg Works, Newark, N. J.: Illustrated price-list devoted to Brick, Plastering, Pointing, Cross Joint and Gauging or Tile Setters' Trowels, Masons' Tool Bags, Brick Jointers, &c.

SMITH & HEMENWAY COMPANY, 296 Broadway, New York: Circulars illustrating and describing the Snow Nail Clipper, Reversible Hog Scraper and the New England Food Chopper.

THE GRIFFIN MFG. COMPANY, Erie, Pa.: Catalogue and price-list devoted to Hinges, Butts, Shelf Brackets, Door Bolts and miscellaneous Hardware. All the company's Wrought Steel Butts, many sizes of Strap and T-Hinges and Door Bolts are made from cold rolled steel and have a smooth and bright finish, which is designated as planished. The better grade of electro-plated goods are made of finely polished steel. The company now has its own rolling mills. All list prices and discount sheets previously issued by the company are superseded by this catalogue.

## TABLE OF DECIMAL EQUIVALENTS.

THE TURNER BRASS WORKS, Chicago, Ill., is sending to its trade a card that has been in frequent request, owing to the information it presents. One side shows a picture of its office and works and a map of the city showing the plant's location. The other side of the card has a table of decimal equivalents for fractions beginning with 1/64 and running up to 1 inch. These equivalents will be of interest to many and we accordingly give them below:

| DECIMAL EQUIVALENTS |             |             |             |
|---------------------|-------------|-------------|-------------|
| 1/64 .0156          | 17/64 .2656 | 33/64 .5156 | 49/64 .7656 |
| 1/32 .0312          | 9/32 .2812  | 17/32 .5312 | 25/32 .7812 |
| 3/64 .0468          | 19/64 .2968 | 35/64 .5468 | 51/64 .7968 |
| 1/16 .0625          | 5/16 .3125  | 9/16 .5625  | 13/16 .8125 |
| 5/64 .0781          | 21/64 .3281 | 37/64 .5781 | 53/64 .8281 |
| 3/32 .0937          | 11/32 .3437 | 19/32 .5937 | 27/32 .8437 |
| 7/64 .1093          | 23/64 .3593 | 39/64 .6093 | 55/64 .8593 |
| 1/8 .125            | 3/8 .375    | 5/8 .625    | 7/8 .875    |
| 9/64 .1406          | 25/64 .3906 | 41/64 .6406 | 57/64 .8906 |
| 5/32 .1562          | 13/32 .4062 | 29/32 .6562 | 45/32 .9062 |
| 11/64 .1718         | 27/64 .4218 | 43/64 .6718 | 59/64 .9218 |
| 3/16 .1875          | 7/16 .4375  | 11/16 .6875 | 15/16 .9375 |
| 13/64 .2031         | 29/64 .4531 | 45/64 .7031 | 61/64 .9531 |
| 7/32 .2187          | 15/32 .4687 | 31/32 .7187 | 47/32 .9687 |
| 15/64 .2343         | 31/64 .4843 | 47/64 .7343 | 63/64 .9843 |
| 1/4 .25             | 1/2 .5      | 3/4 .75     | 1 .1.0      |

## I. S. SPENCER'S SONS.

THE growth and development of the business of I. S.

Spencer's Sons, Guilford, Conn., which is now carried on by the third generation, is the subject of an attractive booklet of 28 pages recently issued. Illustrations are presented of the building in which the business was started in 1857 and of the extensive plant of to-day, together with interior views of the different departments. The products of the company include Gray Iron, Aluminum, Phosphor Bronze, Brass and Composition Castings, Scales, &c.

Cawley & Cawley have sold their business at Kendallville, Ind., to Geo. W. Hoffman and have opened up a new store at Swan, where they will handle general merchandise in connection with Hardware, Stoves, Buggies and Implements.

# FOREIGN TRADE.

## RETURN TO NORMAL TRADE RELATIONS WITH RUSSIA.

THE schedules of the Russian customs tariff affected by the order of Czar Nicholas abrogating the rules in force relative to the levying of supplementary import duties on products of American manufacture include articles 82, 150, 151, 152, 153, 161, 167 (section 2), 173 (section 3), of the general customs tariff for European commerce as well as those providing for the presentation to the customs offices of documents certifying the origin of the products in question. This action, as already referred to in these columns, was cabled from St. Petersburg by the American *Chargé d'Affaires* under date of September 15, the order itself being issued by the Emperor September 10, when directions were also given "to publish the present Imperial order in the *Bulletin des Lois* and to inform by telegraph the customs offices thereof, with instructions to put it into execution without delay."

### The Russian Customs Tariff Schedules

affected are as follows:

150. Cast iron wares:
- Iron castings in the rough....Rubles 1.12½ per 36.07 pounds.
  - Conventional tariff.....Rubles 0.90 per 36.07 pounds.
  - Goods of American origin....Rubles 1.12½ and 20 % per 36.07 pounds.
  - Enameled cast iron vessels.....Rubles 1.50 per 36.07 pounds.
  - Goods of American origin.....20 % additional.
  - Cast iron wares, wrought, ground, polished, even enameled (except vessels), or combined with common metals and wood.....Rubles 2.55 per 36.07 pounds.
  - Conventional tariff.....Rubles 2.10 per 36.07 pounds.
  - Goods of American origin....Rubles 2.55 and 20 % additional.
151. Iron and steel manufactures, forged, stamped, molded, not filed, or filed on the sides, but not otherwise wrought, also forged Nails....Rubles 2.55 per 36.07 pounds.
- Conventional tariff.....Rubles 2.10 per 36.07 pounds.
  - Goods of American origin....Rubles 2.55 per 36.07 pounds plus 30 %.
152. Iron and steel boiler makers' work, as well as all manufactures of sheet iron and steel not specially designated .....Rubles 2.55 per 36.07 pounds.
- Conventional tariff.....Rubles 2.10 per 36.07 pounds.
  - Goods of American origin.....Rubles 2.55 plus 30 %.
153. Iron and steel manufactures, except those specially designated, wrought, turned, polished, ground or otherwise elaborated, weighing over 5 Russian pounds each (1 Russian pound equals 0.90283 pound avoirdupois).....Rubles 2.55 per 36.07 pounds.
- Weighting 5 Russian pounds or less....Rubles 4.05 per 36.07 pounds.
  - Conventional tariff.....Rubles 3.30 per 36.07 pounds.
  - Goods of American origin....Rubles 4.05 per 36.07 pounds plus 30 %.
- Padlocks and Mortise Locks (except of copper) as well as Screws for wood.....Rubles 6 per 36.07 pounds.
- Goods of American origin.....30 % additional.
161. Hand tools for use in crafts, arts and industries, Rubles 2.10 per 36.07 pounds.
- Conventional tariff.....Rubles 1.65 per 36.07 pounds.
  - Goods of American origin....Rubles 2.10 per 36.07 pounds plus 30 %.
- 167 (section 2). Gas Meters, Water Meters, Gas, Caloric, Petroleum and Magnetic Machines, and Engines, Sewing, Knitting Machines, Traction Engines, excepting those for Threshers, all not specially named machines of cast iron, iron or steel, with or without parts of other metals....Rubles 2.55 per 36.07 pounds.
- Conventional tariff.....Rubles 2.10 per 36.07 pounds.
  - Above goods of American origin....Rubles 2.55 per 36.07 pounds plus 30 % additional.
- Additional List of American Products Affected. (Order May, 1901.)**
- 82. Colophony or White Rosin, Pine Pitch, Brewers' Pitch.....Rubles 0.60 per 36.07 pounds.
  - Same of American origin....Rubles 0.72 per 36.07 pounds.
  - 173 (section 3). Bicycles, each. Rubles 18 plus 50 % (rubles 27).
  - Bicycles of American origin.....Rubles 35.10 each. (Above includes Tricycles, &c.)

In the above enumeration it will be seen Agricultural Implements were not involved. The American money equivalent of a ruble is 51½ cents and the Russian unit of weight a pood, consisting of 40 Russian funts or pounds.

### This Change in Russian Policy

naturally suggests some reflections on the direct commercial value of the return to normal conditions as ex-

isting prior to the promulgation of the ukase or edict February 13, 1901. The Department of Commerce and Labor at Washington, through its Bureau of Statistics, has published the total imports by Russia from the United States during the calendar years 1900-1904, inclusive, as well as the imports during 1900-1903, inclusive, into Russia from the United States of the articles affected by the adverse tariff legislation. These articles, which were subject until then to the same conventional rates as were paid by like articles from Germany and other European countries, became subject to rates up to 50 per cent. higher. In May of the same year (1901) an order of the Russian Minister of Finance raised the rates on White Rosin (Colophony), Pine Pitch and Brewers' Pitch by 20 per cent., and that on Velocipedes by 30 per cent., which higher rates have since prevailed.

In order to be able to determine the origin of the articles affected the Russian Government also ordered the presentation of certificates of origin in case the goods bore no trademarks or other proofs of their real origin.

It is interesting to note that the total imports into Russia from the United States, as per the official trade returns of the Russian Government, show but little of the effects of the adverse tariff legislation. The total imports of the United States into Russia are stated by the Russian returns as follows:

|                       |                       |
|-----------------------|-----------------------|
| 1900.....\$22,748,000 | 1902.....\$20,574,000 |
| 1901.....17,984,000   | 1903.....32,531,000   |

Again, preliminary figures for the year 1904, showing the imports from the United States into Russia over the European frontier only, are \$32,163,000. The corresponding figures of the Bureau of Statistics, showing the total exports from the United States to Russia during the same calendar years, are as follows: :

|                      |                       |
|----------------------|-----------------------|
| 1900.....\$8,664,270 | 1903.....\$18,994,548 |
| 1901.....7,207,995   | 1904.....17,823,856   |
| 1902.....13,835,953  |                       |

While the figures of the two Governments, measuring the same trade movement for the same period, show wide discrepancies, neither of them discloses any serious effect of the discrimination upon the growth of the general trade movement. The main reason for this phenomenon is attributed to the fact that the bulk of imports in Russia from the United States consists of raw cotton, which was as follows: 1900, \$18,417,000; 1901, \$12,467,000; 1902, \$13,595,000; 1903, \$24,338,000, and 1904, \$24,060,000. By comparing the values of the cotton imports with those of the total imports into Russia from this country it is seen that the larger or smaller size of the total import figures for the respective years depends mainly upon the magnitude of the figures showing the cotton imports from the United States during the same periods.

### Accurate Figures Impossible.

As remarked in a previous article on this subject, the lack of direct communication makes it impossible to keep accurate figures of all exports from the United States to Russia, many of our exports being credited to Germany and other countries and transshipped. The imports of manufactures of cast iron increased from \$19,955 in 1900 to \$45,722 in 1903; Hand Tools, from \$15,315 to \$64,532; machinery, from \$223,529 to \$338,694, while under the general head of manufactures of iron and steel the increase was from \$45,373 in 1900 to \$363,555 in 1902, and fell off to \$67,555 in 1903. Naval stores more than doubled—from \$186,552 in 1900 to \$404,226 in 1903. The combined figures of imports from the United States of articles subject to discriminating duties show an increase of from \$501,558 in 1900 to \$951,106 in 1903.

## DISQUIETING ADVICES FROM ARGENTINE REPUBLIC.

MANUFACTURERS and exporters of Agricultural Implements to the Argentine Republic have been greatly exercised by the receipt within the last few days of many cable advices from Buenos Ayres calling attention to the proposed levying of prohibitive duties on parts of Agricultural Machinery. Leaders in this line of exports have been actively engaged in making repre-

sentations to the State Department at Washington, which has caused the officials there to call for a report in the premises from A. M. Beaupre, the American Minister at Buenos Ayres, with a view to addressing the Argentine Government on the subject if on investigation it is found the matter can properly be brought to its attention. The subject is an important one, as that country is taking this year what it is said will aggregate several million dollars' worth of Agricultural Machinery, the past season's business being unusually large. Upward of \$1,000,000 worth of Threshers alone, with the accompanying farm Engines, have been exported. It has been the practice to sell Machinery of this character on a close margin, relying on the profit in furnishing parts and repairs in future seasons to make the business profitable.

### AUSTRALIAN NOTES.

MELBOURNE, August 10, 1905.

FROM OUR SPECIAL CORRESPONDENT.

**W**HILE the trading outlook is really bright, and harvesting prospects more than ordinarily so, still the buying and selling of the past two months have been below normal. Local manufacturers, especially implement makers, are keeping fairly busy, and the demand for mining tools and requirements is good and steady.

The British Board of Trade has sent a special commissioner to Australia in the person of R. J. Jeffray. This gentleman is now with us and is pushing inquiries with a view to securing for England as much as possible of the trade of Australia at present enjoyed by America, Germany and other countries.

The International Harvester Company of America, in a letter to the Melbourne *Argus*, offers to the Federal Government of Australia one thousand (or as many more as they want) harvesters, equal in every respect to those at present imported by the International Harvester Company and delivered f. o. b. cars at Chicago, in a reasonable time, at £38 10s. 10d. each, plus the statutory 10% levied here. This offer is made as the result of violent political controversy and newspaper argument regarding the invoice value of these machines and as an answer to the action of the Federal Customs Minister in raising the value for duty from £38 10s. to £65 per machine. There is bitter rivalry between the foreign and local makers of harvesters, and the Minister's action apparently supports the contention of the local party, that machines sold at £80 and upward are undervalued when assessed for duty at £38 10s. There can be little doubt that the issue of the battle will be the giving of a large added protection to the harvester industry of Australia, to the detriment of the profits on the American goods. This particular industry has gone ahead wonderfully during the past few years and, with the ever increasing area of country under cultivation, bids fair to keep going at the same pace.

The Government Statistician, T. A. Coghlan, has issued his Trade and Customs Returns for 1904. The full trade of the Commonwealth amounted in value to £94,510,058, as compared with £85,981,635 in 1903. This increase was due entirely to the exports, for the imports were slightly less than last year—£37,020,842, as against £37,811,471. With a considerably increased wool clip, however, the exports rose from £48,170,164 to £57,489,216. On the import side the most noticeable feature is the extent to which British goods, without any preferential tariff, have gained apparently on those from other countries. In 1903 the imports from the United Kingdom totaled about 52 per cent. of the whole, whereas in 1904 fully 60 per cent. of the goods landed at these ports from overseas were described as of British origin.

### NEW CASTLE FORGE & BOLT COMPANY.

**N**EW CASTLE FORGE & BOLT COMPANY, whose plant at New Castle, Pa., was completely destroyed by fire about a month ago, advises us that it has erected

temporary buildings and has resumed operations, being again in excellent shape to take care of business. These temporary buildings will be replaced as soon as possible by steel buildings, contracts for which have been placed.

## FACTORY COST AND BUSINESS METHODS.

### MODERN COMMERCIAL AND INDUSTRIAL ACCOUNTING PRACTICE.

BY HERBERT FOSTER, NEW HAVEN, CONN.

*The first article in this series, which was published in our last issue, treated of the importance of correct accounting and contained a description of the private ledger as the key to the system of accounts, and gave an illustration, with explanation, of the monthly recapitulation page of the department account ledger.*

#### Second Article.

**W**E will now assume that the business of the year is completed and the annual statement is made up as follows:

#### ANNUAL STATEMENT, DECEMBER 31.

| Assets.                                      |                                  |
|--|----------------------------------|
| Real estate and buildings.....               | \$52,500.00                      |
| Machinery .....                              | 125,375.95                       |
| Tools .....                                  | 79,650.75                        |
| Notes receivable.....                        | 15,559.10                        |
| Accounts receivable.....                     | 375,664.22                       |
| Cash .....                                   | 20,375.00                        |
| Inventory of Merchandise and materials ..... | 523,817.64                       |
| Liabilities.                                 |                                  |
| Capital stock.....                           | \$350,000.00                     |
| Surplus .....                                | 589,258.05                       |
| Depreciation .....                           | 22,477.66                        |
| Notes payable.....                           | 200,000.00                       |
| Accounts payable.....                        | 25,456.90                        |
| Labor and rebates due and unpaid .....       | 5,750.05                         |
|  | <hr/>                            |
|  | \$1,192,942.66    \$1,192,942.66 |

After all entries are made up to and including December 31 the inventory of merchandise, material, supplies, &c., is credited to the various accounts on the department ledger.

The unclassified column, where such items as salaries, taxes, agents' expenses, &c., remain until this time, is now distributed to the departments A, B, C, D and E. The correct method for proportioning these expenses is one which is apt to give some "food for thought." The percentage cannot be a fixed one. For some accounts a percentage based on the total sales may be used; in other instances the average percentage of work performed, say, by the buffing department, for other departments, must be the basis; so that this distribution must depend upon and can be accomplished correctly only by the accountant possessing a thorough knowledge of the business involved.

#### Final Yearly Report.

After all is distributed the result will furnish a report as illustrated in Fig. 3, showing a complete analysis of the total gross gain for the year, which amounts to \$100,826.96, and, after depreciation is deducted, a net gain of \$78,349.30, which agrees with the amount of profit carried to surplus account in the private ledger. This analysis shows that for the year's operations departments A, B, C and E were profitable, while department D sustained a loss.

#### Income Statement.

From this final report (Fig. 3) can now be made up the income statement for the year, which for the condensed information it presents and for purpose of comparison will be found very valuable and interesting. The income statement is as follows:





## RURAL DELIVERY P. O. ORDER TEMPORARILY SUSPENDED.

FROM OUR WASHINGTON CORRESPONDENT.

WASHINGTON, D. C., September 26, 1905.

THE order of Fourth Assistant Postmaster-General De Graw, under which catalogue houses would have been able to secure complete mailing lists covering the entire rural free delivery service, has been suspended and the matter will now be held in abeyance until the return of Postmaster-General Cortelyou, who is expected to reach Washington about October 1. The action taken is the result of a flood of protests by mail and telegraph that have poured in upon the Department since the charter of Mr. De Graw's order became known, and there is good reason to believe that the order will ultimately be rescinded and that the Department will stand upon its time-honored record in the matter of treating as confidential the names and addresses of all patrons of the postal service. Although the head of the Department and the Fourth Assistant were both absent, the subordinate officials in the latter's office promptly reached the conclusion that in the interest of the Government as well as of all parties to the controversy the wisest thing to do would be to suspend the new order until a further investigation of its merits and demerits could be made by the heads of the Department.

### The Suspending Order.

The original regulations provided that "each rural mail box in use on a rural route, which, under the regulations of the Department, is entitled to service, shall be designated by number in the manner and by the method hereinafter set forth; and the delivery by rural carriers of ordinary mail matter of all classes addressed to such boxes by number alone is authorized so long as improper and unlawful business is not conducted thereby." When it was determined to suspend this order a circular letter was prepared and forwarded to all postmasters from whose offices rural routes radiate substantially in the following form:

Referring to the Department's recent order regarding the numbering of rural mail boxes, you are hereby informed that that portion of the order authorizing the delivery by rural carriers of ordinary mail matter of all classes addressed to such boxes by number alone is hereby suspended.

### Mail Order Houses Early on the Move.

Mr. De Graw's original order did not authorize postmasters to furnish to applicants the number of routes radiating from their offices and the number of boxes on each route, but authority to supply this information was given to postmasters as rapidly as inquiries with regard to the scope of the new order were received. In some sections the mail order concerns appear to have applied to postmasters in anticipation of the new order, and these postmasters submitted the applications to the Department, which authorized the information to be furnished. Postmasters who have received this authorization will hold it in abeyance, and to all new inquiries that may be received replies will be sent stating that no information whatever is to be furnished until further orders.

### Numbering the Boxes Will Go On.

One feature of the Department's plan, that of numbering the boxes, will not be interrupted by the order of suspension. There is no objection on any score to this plan, which was primarily designed in the interest of the country merchant. It has been found that substitute carriers have frequently made errors in delivering local mail in the shape of letters, circulars, packages, &c., through their lack of familiarity with the names of the patrons of their routes. Mr. De Graw thought that the local merchants would soon fall into the way of addressing all such mail to their customers by both name and box number. Such a system would obviate many errors and would be of no advantage to the catalogue houses. If this feature of the new plan is retained it will doubtless be entirely satisfactory to the country merchant, whose objections to Mr. De Graw's order are

based upon the feature permitting carriers to deliver mail addressed by box number alone and not by name.

### A Retail Merchant's Letter.

The suspension of the De Graw order will be hailed with gratification by retailers throughout the country, who have been filled with consternation and surprise that the Department should so soon reverse its well defined policy. The Department stands well with the retail merchants, who have come to rely upon it for fair treatment in their competition with the mail order houses. The attitude of retailers in all lines toward the Department and their views with regard to the De Graw innovation are accurately reflected in the following communication received here from a prominent merchant in a Western town:

The retail trade of the entire country is more than surprised at this reversal of the policy of the Post Office Department. The action taken certainly puts the Department in an astonishing position. Merchants have come to regard the Department as disposed to take a very broad view of its duty in such matters. The propriety of action in such cases should be not merely a question of what the Department can legally do with regard to the rural free delivery service or what can be done on the basis of precedent already established in other branches of the service. In creating the rural free delivery Congress made a very remarkable departure in the nature of a gigantic experiment, and the results have not been wholly beneficial to the country at large. The small community has suffered, and must continue to suffer, no matter how conservatively the institution may be developed. But the Department certainly owes it to the people at large to reduce this injury to a minimum. Fourth Assistant Postmaster-General Bristow took this view, and it was largely due to his activity that Congress wiped out the rural carriers' express package privilege and reformed other abuses. The late Postmaster-General Payne was not slow to see the propriety of the protests filed against Machen's order and rescinded it. Postmaster-General Cortelyou only recently strengthened Mr. Payne's order and thereby greatly pleased retailers everywhere. We are not prepared to believe that the Department proposes to abandon these reforms and take the back track.

### Mr. Cortelyou's Instructions as to Posting of Lists.

Among the communications with regard to the De Graw order received here are several inquiring as to the terms of the regulation promulgated last June by Postmaster-General Cortelyou when it was discovered that certain postmasters were still operating under the Machen order requiring addresses to be collected and posted in local offices and authorizing postmasters to supply them to all applicants. There seems to be some uncertainty concerning the tenor of Mr. Cortelyou's instructions and they are therefore here presented, as follows:

Ordered, That order of the First Assistant Postmaster-General dated December 10, 1902, under which instructions were given postmasters at rural free delivery offices to prepare lists of all patrons of rural routes and post the same in conspicuous places in their offices, which is in effect a modification of paragraph 3, section 549, Postal Laws and Regulations, prohibiting the furnishing of lists of names of patrons of post offices by postmasters or other employees, be, and said order is, hereby rescinded, and that all lists of names posted under instructions given as above mentioned be withdrawn.

It seems to be the very natural assumption on the part of those who have inquired with regard to Mr. Cortelyou's order that the official who took the position therein stated cannot countenance the De Graw order and will be disposed to rescind it as soon as he is made aware of the state of public opinion concerning it.

### Retail Merchants Must Protest Vigorously.

Although the obnoxious order has been suspended it will take vigorous work on the part of retail merchandising interests throughout the country to secure its complete revocation. Of course the catalogue houses are bringing pressure to bear to prevent the abrogation of the ruling and are enlisting in this work a certain class of newspapers that are not wholly without influence. The suspension of the order will give the retailers an opportunity to be heard, however, as it is probable that further action will be deferred for at least a week from the date of this correspondence.

W. L. C.

Bloom & Lawritson have recently engaged in business at Loomis, Neb., handling Shelf and Heavy Hardware in connection with Stoves, Implements and Sporting Goods.

### Springs.

George A. Hebb, 70 William street, Newark, N. J., manufacturer of machinery, railway and agricultural springs of every description, makes a specialty of experimental work in connection with springs. The highest grade of steel, it is said, is used, the workmanship being also of the best.

### Machinists' Screw Driver.

The machinists' screw driver shown herewith is made of tough crucible steel of a size  $\frac{1}{2}$  inch square. The blade is milled so as to leave diagonally across each side a short projection of the same thickness as the point, making two offset screw driver blades. Inaccessible screws by means of the offsets may be ratcheted



*Machinists' Screw Driver.*

tight, as the length of the tool allows a 10-inch leverage. When used as an ordinary blade a wrench may be employed on the square shank. The shank extends entirely through the handle and a large rivet passes through the ferrule. The tool is heavy and strong, built for hard usage and is fully warranted. It is manufactured by H. H. Mayhew Company, Shelburne Falls, Mass.

### Walker's Quick and Easy Meat and Fruit Juice Presses.

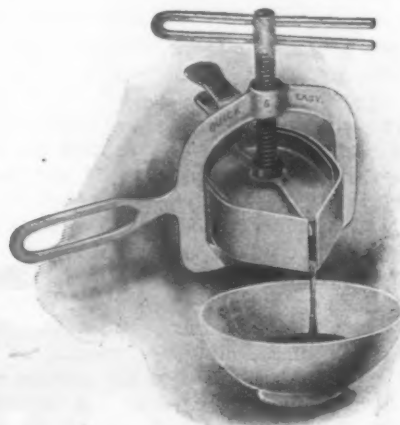
Erie Specialty Company, Erie, Pa., is introducing meat and fruit juice pressers, as shown in the accompanying cuts. The juice is discharged through the open slot at the pointed end of an inclined pan as soon as extracted, preventing clogging or the soaking back of the juice into



*Fig. 1.—Walker's Quick and Easy Meat and Fruit Juice Press.*

the meat, more juice being thus obtained. The press plate and pan being removable are easy to clean and keep in a sanitary condition. As all the juice is out as soon as the plate is screwed down, several pounds can be pressed in a short space of time. The presses are made in the three styles shown in the cuts and in three sizes of each style. The frame is made of malleable iron, and the square thread steel screw with long nut, it is remarked, will not cut out. The press shown in Fig. 1 is made to clamp to a table and has a pan  $4\frac{1}{4}$  inches long,  $3\frac{3}{4}$  inches wide and  $1\frac{1}{4}$  inches deep, which when in use is  $5\frac{1}{2}$  inches above the table. The press illustrated in Fig. 2 has a pan of the same size and is designed to be held in the hand when extracting juice from oranges, lemons or other fruit. The pan of the press shown in Fig. 3 is

3 inches long,  $1\frac{1}{4}$  inches wide and  $1\frac{1}{4}$  inches deep and is intended for use where a small quantity of fruit juice is required. The three styles in which each size of press is made are as follows: Japanned frame, tinned cup and pan; japanned frame, aluminum cup and pan; nickled frame, aluminum cup and pan. The press with iron cup



*Fig. 2.—Walker's Quick and Easy Fruit Press.*

and pan, shown in Fig. 1, weighs 4 pounds, the two with iron cup and pan press illustrated in Fig. 2 weighs 3 aluminum cup and pan weighing each  $2\frac{1}{4}$  pounds. The pounds, the two with aluminum cup and pan weighing each 2 pounds. The weight of the iron cup and pan



*Fig. 3.—Smaller Size of Walker's Quick and Easy Fruit Press.*

press shown in Fig 3 is  $1\frac{1}{2}$  pounds, the two with aluminum cup and pan weighing each 1 pound.

### Baker's Concrete Conveyor No. 8.

Sterling Wheelbarrow Company, 243 Grove street, Milwaukee, Wis., is introducing the concrete conveyor shown in the accompanying cut. It will hold and convey 3 cubic feet of thin, wet concrete and has a capacity of



*Baker's Concrete Conveyor No. 8.*

$4\frac{1}{2}$  cubic feet of dry material. The conveyor is mounted on sterling roller bearing wheels and can be wheeled with ease on a single plank. It is particularly adapted to feeding concrete mixers and dumps into a hopper. The manufacturer alludes to the saving in labor and material by the use of the conveyor; also to its durability.

**Bi-Treadle Grindstone No. 014.**

Wilcox Mfg. Co., Aurora, Ill., is putting on the market the Wilcox Ideal mounted grindstone shown herewith. The frame is of steel and hard wood, braced and reinforced to make it rigid and to prevent vibra-



*Bi-Treadle Grindstone No. 014.*

tion. The cranks and shaft are on ball bearings and the steel axle is accurately centered. The seat is adjustable and the frame is provided with a combination water guard and rest. Stones of three sizes are mounted on these frames as follows: No. 1, 90 to 110 pounds; No. 2, 70 to 80 pounds, and No. 3, 40 to 50 pounds.

**The Stevens Lady Model Ideal Rifle No. 56.**

J. Stevens Arms & Tool Company, Chicopee Falls, Mass., is putting on the market the Lady Model rifle illustrated herewith. It is referred to as being graceful, perfectly balanced, light in weight and of the best finish. The combination of sights gives practically two sets—one for target work and the other set (when the peep sight is folded down and the combination front sight adjusted as an open sight) for open hunting work. This rifle will be furnished on special order only. The action is the company's latest, known as the sliding bolt type, and is operated the same as its Ideal rifles Nos. 44½ to 54. It is fitted with half octagon barrel, 24 inches in length for rim fire cartridges and 26 inches long for center fire cartridges. The frame and action are case hardened, and the stock and forearm are of fancy selected walnut, highly finished and checked. The butt plate is optional, either the company's regular shotgun rubber or the Swiss butt plate, case hardened. The sights for the rifle are the company's D combination, consisting of a Beach combina-



*The Stevens Lady Model Ideal Rifle No. 56.*

tion front, sporting rear and Vernier peep sight; but it can also be furnished without additional charge with Lyman No. 1 and No. 5 sights and an open rear sight.

The weight complete is 6½ pounds. The ammunition for this model will be 0.22 short rim fire, 0.22 long rifle rim fire, 0.22-7-45 rim fire, 0.25 Stevens rim fire and 0.32 long rim fire. It will also be chambered to take the 0.22-15-60 Stevens center fire cartridge.

**New Adjustable Hook Husker, Style 59.**

The corn husker shown herewith has a strong steel shield with a steel hook capable of being changed to 14 different positions by adjusting it in the different holds in the shield. The leather used is alluded to as strong,



*New Adjustable Hook Husker, Style 59.*

soft and pliable. The husker has just been added to the line of the Boss Mfg. Company, Kewanee, Ill., whose New York office is at 48 Leonard street.

**Monitor Coffee Mill.**

The new coffee mill shown in the accompanying cut has the bottom and body drawn from a single piece of sheet steel, so that it cannot be pulled apart. The grinders have feeding prongs to quickly gather in the coffee, while the grinders are easily taken apart to clean,



*Monitor Coffee Mill.*

and can be used for both coffee and spices. The bolt which turns the grinders is of wrought steel. A seamless steel receptacle in the body of the mill fits closely over the grinding parts and catches the ground coffee. The mill adjusts for coarse or fine grinding, and is fin-

ished in glossy black japan. The mill is now being put on the market by the Bronson-Walton Company, Cleveland, Ohio.

## Bristol Fishing Reels and Rods.

The Horton Mfg. Company, Bristol, Conn., is offering the reel and rod shown in the accompanying cuts. In Fig. 1 is illustrated a combined reel and handle which can be used with any of the company's jointed bait or bass steel rods. The length of the handle over all is 16 inches. Among the points of excellence mentioned by the company are the following: That the reel is on a line with the center of the handle, thus equally dividing the weight and producing a perfect balance, because it will not turn in the hand; that a perfect operation of the reel is afforded, as it does not turn to the under side

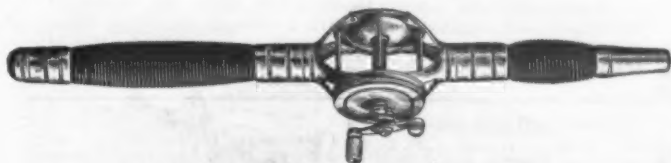


Fig. 1.—Bristol Combination Reel and Handle.

of the rod, but hangs naturally, and that the spool is easily controlled by the thumb. The reel is all metal, with polished steel pivots and bearings, finished in heavy nickel plate. It has a quadruple action, with click and drag; also screw off oil cups and ivory balanced handle. The spool is free running and holds from 80 to 100 yards of line. The handle is furnished with grips of polished maple, celluloid wound, or cork. The jointed steel rod illustrated in Fig. 2 is composed of two joints and handle, which cannot warp. The rod is 6 feet 9 inches long, with joints 31 inches long, and weighs 26 ounces. The handle is 24½ inches long, has 1-inch reel seat, celluloid

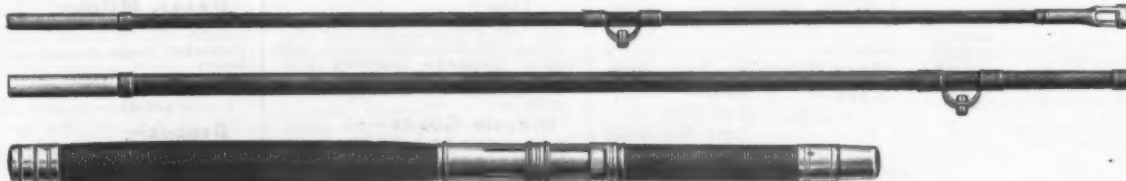


Fig. 2.—Bristol Salt Water Rod.

wound grips with nickel plated trimmings. The guides are special agate or German silver mounted with agate stirrup top or German silver mounted.

## Marble's Axe Edge Protector.

Marble Safety Axe Company, Gladstone, Mich., is putting on the market the axe edge protector shown



Marble's Axe Edge Protector.

herewith. It may be attached or detached in an instant and carried in the vest or coat pocket without inconvenience. The device is designed for chopping axes,

## PAINTS, OILS AND COLORS

## Animal, Fish and Vegetable Oils—

|   |    |     |
|---|----|-----|
| Linseed, City, raw.....                     | 54 | @55 |
| Linseed, City, boiled.....                  | 56 | @57 |
| Linseed, Slate and West'n raw.....          | 52 | @53 |
| Linseed, raw Calcutta seed.....             | 62 | @63 |
| Lard, Extra Prime, Winter.....              | 61 | @62 |
| Lard, Extra No. 1.....                      | 47 | @50 |
| Lard, No. 1.....                            | 37 | @42 |
| Cotton-seed, Crude, f.o.b. mills.....       | 19 | @20 |
| Cotton-seed, Summer Yellow.....             | 25 | @26 |
| Prime.....                                  | 25 | @26 |
| Cotton-seed, Summer Yellow, off grades..... | 21 | @22 |
| Sperm, Crude.....                           | 55 | @56 |
| Sperm, Natural Spring.....                  | 57 | @58 |
| Sperm, Bleached Spring.....                 | 59 | @60 |
| Sperm, Natural Winter.....                  | 60 | @61 |
| Sperm, Bleached Winter.....                 | 63 | @64 |
| Tallow, Prime.....                          | 61 | @62 |
| Whale, Crude.....                           | 42 | @43 |
| Whale, Natural Winter.....                  | 42 | @43 |
| Whale, Bleached Winter.....                 | 44 | @45 |
| Menhaden, Brown, Strained.....              | 27 | @28 |
| Menhaden, Light, Strained.....              | 23 | @24 |
| Menhaden, Bleached, Winter.....             | 31 | @32 |
| Menhaden, Ex-Bld., Winter.....              | 31 | @32 |
| Menhaden, Southern.....                     | 16 | @17 |
| Cocunut, Ceylon.....                        | 74 | @75 |
| Cocunut, Cochon.....                        | 74 | @75 |
| Cod, Domestic, Prime.....                   | 34 | @35 |
| Cod, Newfoundland.....                      | 39 | @40 |
| Red, Elaine.....                            | 33 | @34 |
| Red, Saponified.....                        | 44 | @45 |
| Olive, Italian, bbls.....                   | 58 | @59 |
| Nearfoot, prime.....                        | 49 | @50 |
| Palm, Lagos.....                            | 16 | @17 |

## Mineral Oils—

|                                       |    |     |
|---------------------------------------|----|-----|
| Black, 29 gravity, 25¢ cold test..... | 10 | @11 |
| Black, 29 gravity, 15 cold test.....  | 11 | @12 |
| Black, Summer.....                    | 10 | @11 |
| Cylinder, light filtered.....         | 18 | @19 |
| Cylinder, dark filtered.....          | 16 | @17 |
| Paraffine, 90-907 gravity.....        | 12 | @13 |
| Paraffine, 903 gravity.....           | 11 | @12 |
| Paraffine, 883 gravity.....           | 9  | @10 |
| Paraffine, Red.....                   | 11 | @12 |
| In small lots ½¢ advance.             |    |     |

## Miscellaneous—

|                              |     |      |
|------------------------------|-----|------|
| Barytes, White, Foreign..... | 17  | @18  |
| Barytes, Amer. floated.....  | 18  | @19  |
| Barytes, Crude, No. 1.....   | 10  | @11  |
| Chalk, in bulk.....          | 3   | @4   |
| Chalk, in bbls.....          | 100 | @100 |
| China Clay, English.....     | 11  | @12  |
| Cobalt, Oxide.....           | 100 | @100 |
| Whiting, Common.....         | 100 | @100 |
| Whiting, Gilders.....        | 100 | @100 |
| Whiting, Ex. Gilders.....    | 100 | @100 |

## Putty, Commercial—

|                           |   |       |
|---------------------------|---|-------|
| In bladders.....          | 1 | @1.75 |
| In bbls. or tubes.....    | 1 | @1.15 |
| In 1 lb to 5 lb cans..... | 2 | @2.90 |
| In 12½ to 50 lb cans..... | 1 | @1.55 |

## Spirits Turpentine—

|                      |    |      |
|----------------------|----|------|
| In Oil bbls.....     | 67 | @67½ |
| In machine bbls..... | 67 | @68  |

## Glue—

|                        |    |     |
|------------------------|----|-----|
| Cabinet.....           | 11 | @15 |
| Common Bone.....       | 7  | @9  |
| Extra White.....       | 18 | @24 |
| Foot Stock, White..... | 11 | @14 |
| German Hide.....       | 12 | @18 |
| French.....            | 10 | @40 |
| Irish.....             | 13 | @16 |
| Low Grade.....         | 9  | @12 |
| Medium White.....      | 14 | @17 |

## Gum Shellac—

|                          |    |     |
|--------------------------|----|-----|
| Bleached Commercial..... | 37 | @38 |
| Bone Dried.....          | 47 | @48 |
| Button.....              | 26 | @45 |
| Diamond I.....           | 45 | @46 |
| Fine Orange.....         | 45 | @47 |
| A. C. Garnet.....        | 44 | @44 |
| D. C.....                | 50 | @52 |
| Octagon B.....           | 41 | @43 |
| T. N. O.....             | 58 | @58 |
| V. S. O.....             | 58 | @58 |

## Colors in Oil—

|                       |    |     |
|-----------------------|----|-----|
| Black, Lampblack..... | 12 | @14 |
| Blue, Chinese.....    | 36 | @46 |
| Blue, Prussian.....   | 32 | @36 |

|                        |    |     |
|------------------------|----|-----|
| Blue, Ultramarine..... | 13 | @16 |
| Brown, Vandyke.....    | 11 | @14 |
| Green, Chrome.....     | 10 | @15 |
| Green, Paris.....      | 21 | @21 |
| Sienna, Raw.....       | 12 | @15 |
| Sienna, Burnt.....     | 12 | @15 |
| Umber, Raw.....        | 11 | @14 |
| Umber, Burnt.....      | 11 | @14 |

## White Lead, Zinc, &amp;c.—

|   |    |      |
|---|----|------|
| Lead, English white, in Oil.....  | 9  | @9½  |
| Lead, American white, in Oil.....   | 9  | @9½  |
| Lots of 500 lb or over.....   | 6  | @6½  |
| Lots less than 500 lb.....  | 7  | @7   |
| In Barrels.....   | 6  | @6   |
| Lead, White, in oil, 25 lb tin.....   | 6  | @6   |
| Lead, White, in oil, 12½ lb tin.....  | 6  | @6   |
| Lead, White, in oil, 1 to 5 lb.....   | 6  | @6   |
| Lead, White, add to keg price.....  | 6  | @6   |
| Lead, White, in oil, 1 to 5 lb.....   | 6  | @6   |
| Lead, American, Terms: For lots 12 tons and over ¼¢ rebate; and 2% for cash if paid in 15 days from date of invoice; for lots of 500 lbs. and over 2% for cash if paid in 15 days from date of invoice; for lots of less than 500 lbs. net..... | 6  | @6   |
| Lead, White, Dry in bbls.....   | 6  | @6   |
| Zinc, American, dry.....  | 4  | @4   |
| Zinc, French.....   | 4  | @4   |
| Paris, Red Seal, dry.....   | 9  | @9   |
| Antwerp, Red Seal, dry.....   | 7  | @7   |
| Antwerp, Green Seal, dry.....   | 9  | @9   |
| Zinc, V. M. French, in Poppy Oil.....   | 12 | @12½ |
| Green Seal.....   | 12 | @12½ |
| Lots of 1 ton and over.....   | 12 | @12½ |
| Lots of less than 1 ton.....  | 12 | @12½ |
| Zinc, V. M. French, in Poppy Oil.....   | 12 | @12½ |
| Red Seal.....   | 12 | @12½ |
| Lots of 1 ton and over.....   | 12 | @12½ |
| Lots of less than 1 ton.....  | 12 | @12½ |
| Discounts—French.....   | 12 | @12½ |
| to buyers of 10 bbl. lots of one or mixed grades. 1% 25 bbls., 2% 50 bbls., 4%.....   | 12 | @12½ |

## Dry Colors—

|                        |   |     |
|------------------------|---|-----|
| Black, Carbon.....     | 5 | @10 |
| Black, Drop, Amer..... | 4 | @6  |
| Black, Drop, Eng.....  | 5 | @15 |

|   |     |        |
|---|-----|--------|
| Black, Ivory.....                       | 16  | @20    |
| Lamp, Com.....                          | 14  | @16    |
| Blue, Celestial.....                    | 4   | @6     |
| Blue, Chinese.....                      | 22  | @32    |
| Blue, Prussian.....                     | 27  | @30    |
| Blue, Ultramarine.....                  | 14  | @15    |
| Brown, Spanish.....                     | 4   | @1     |
| Carmine, No. 40.....                    | 3   | @3.60  |
| Green, Chrome, ordinary.....            | 3   | @6     |
| Green, Chrome, pure.....                | 17  | @25    |
| Lead, Red, bbls., ½ bbls. and kegs..... | 6   | @6     |
| Lots 500 lb or over.....                | 6   | @6     |
| Lots less than 500 lb.....              | 7   | @7     |
| Litharge, American, bbls.....           | 6   | @6     |
| Ocher, American.....                    | 1   | @1.00  |
| Ocher, American Golden.....             | 2   | @2½    |
| Ocher, French.....                      | 14  | @14    |
| Ocher, Foreign Golden.....              | 3   | @4     |
| Orange Mineral, English.....            | 8   | @10    |
| Orange Mineral, French.....             | 10  | @12½   |
| Sienna, Italian, Burnt.....             | 8   | @11    |
| Orange Mineral, American.....           | 8   | @8½    |
| Red, Indian, English.....               | 4   | @4½    |
| Red, Indian, American.....              | 3   | @3½    |
| Red, Turkey, English.....               | 4   | @10    |
| Red, Tuscan, English.....               | 7   | @10    |
| Red, Venetian, Amer.....                | 100 | @10.50 |
| Red, Venetian, English.....             | 100 | @11.75 |
| Sienna, Italian, Burnt.....             | 3   | @3½    |
| Sienna, Ital. Raw. Powd.....            | 3   | @4     |
| Sienna, American, Raw.....              | 1   | @2     |
| Sienna, American, Burnt.....            | 1   | @2     |
| Powdered.....                           | 1   | @2     |
| Talc, French.....                       | 1   | @1.00  |
| Talc, American.....                     | 1   | @1.00  |
| Terra Alba, French.....                 | 100 | @1.00  |
| Terra Alba, English.....                | 100 | @1.00  |
| Terra Alba, American.....               | 100 | @1.00  |
| No. 1.....                              | 0   | @70    |
| Terra Alba, American.....               | 100 | @1.00  |
| No. 2.....                              | 45  | @50    |
| Umber, Frey, Bnt. & Pow.....            | 2   | @2½    |
| Umber, Turkey, Raw & Pow.....           | 2   | @2½    |
| Umber, Burnt, Amer.....                 | 14  | @14    |
| Umber, Raw, Amer.....                   | 14  | @14    |
| Yellow Chrome.....                      | 11  | @11    |
| Vermilion, American Lead.....           | 10  | @25    |
| Vermilion, Quicksilver, bulk.....       | 6   | @6     |
| Vermilion, Quicksilver, bags.....       | 6   | @6     |
| Vermilion, English, Import.....         | 75  | @75    |
| Vermilion, Chinese.....                 | 30  | @30.00 |

# Current Hardware Prices.

**General Goods.**—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

**Special Goods.**—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

**Range of Prices.**—A range of prices is indicated by means of the symbol @. Thus 33 1/2 @ 33 1/2 & 10 % signifies

that the price of the goods in question ranges from 33 1/2 per cent. discount to 33 1/2, and 10 per cent. discount.

**Names of Manufacturers.**—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1905, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

**Standard Lists.**—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

**Additions and Corrections.**—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

## Adjusters, Blind—

Domestic,  $\frac{1}{2}$  doz. \$3.00.....33 1/2 %  
North's.....10 %  
Zimmerman's—See Fasteners, Blind.

## Window Stop—

Ives' Patent.....35 %  
Taplin's Perfection.....35 %

**Ammunition—**See Caps, Cartridges, Shells, &c.

## Anvils—American—

Eagle Anvils..... $\frac{1}{2}$  lb 6 1/2 @ 7 1/2  
Hay-Budden, Wrought.....99 1/2 %  
Horseshoe Brand, Wrought.....99 1/2 %  
Trenton..... $\frac{1}{2}$  lb 9 1/2 @ 9 1/2

## Imported—

Peter Wright & Sons..... $\frac{1}{2}$  lb 10 1/2 @

**Anvil, Vise and Drill—**

Millers Falls Co., \$18.00.....15 & 10 %

**Apple Parers—**See Parers, Apple, &c.

**Aprons, Blacksmiths'—**

Livingston Nail Co.....30 1/2 %

**Augers and Bits—**

Com. Double Spur.....75 @ 75 & 5 %

Jennings' Patn., reg. finish.....50 & 1 1/2 @ 60

Black Lip or Blued.....60 & 10 %

Boring Mach. Augers.....70 & 10 %

Car Bits, 12-in. twist.....50 & 10 %

Ford's Auger and Car Bits.....40 & 5 %

Forester Pat. Auger Bits.....25 %

C. E. Jennings & Co.:  
No. 15 ext. lip, R. Jennings' list.....25 %

No. 20, R. Jennings' list.....25 & 10 & 2 1/2 %

Russell Jennings.....25 & 10 & 2 1/2 %

L'Hommiedieu Car Bits.....15 %

Mayhew's Countersink Bits.....15 %

Miller's Falls.....35 %

Ohio Tool Co.'s Bailey Auger and Car Bits.....10 & 10 %

Pugh's Black.....20 %

Pugh's Jennings' Pattern.....20 %

Snell's Auger Bits.....60 %

Snell's Bell Hangers' Bits.....60 %

Snell's Car Bits, 12-in. twist.....50 & 10 %

Wright's Jennings' Bits.....50 %

**Bit Stock Drills—**

See Drills, Twist.

**Expansive Bits—**

Clark's small, \$18, large, \$25.....50 & 10 %

Clark's Pattern, No. 1,  $\frac{1}{2}$  doz. \$25.....65 %

No. 2, \$100.....65 %

Ford's, Clark's Pattern.....60 & 5 %

C. E. Jennings & Co., Steer's Pat. 25.....25 %

Swan's.....60 %

**Gimlet Bits—**

Common Dble. Out.....Per gro. \$3.00 @ \$3.25

German Pattern, Nos. 1 to 10, \$4.00; 11 to 15, \$5.75

**Hollow Augers—**

Bonney Pat., per doz. \$5.50 @ 6.00

Ames.....25 & 10 %

Universal.....20 %

Wood's Universal.....25 %

**Ship Augers and Bits—**

Ford's.....35 & 5 %

C. E. Jennings & Co.:  
L'Hommiedieu's.....15 %

Watrous.....35 & 5 %

Ohio Tool Co.....40 %

Snell's.....40 %

**Awl Hafts—**See Hafts, Awl.

**Awls—**

Brad Awls:  
Handled.....gro. \$2.75 @ \$3.00

Unhdded, Shldered.....gro. \$3 @ \$3.60

Unhanded, Patent.....gro. \$3 @ \$3.60

Peg Awls:  
Unhanded, Patent.....gro. \$1 @ \$1.40

Unhdded, Shldered.....gro. \$3 @ \$3.60

Scratch Awls:  
Handled, Com.....gro. \$3.50 @ \$4.00

Handled, Socket.....gro. \$11.50 @ \$12.00

Hurwood.....10 %

**Awl and Tool Sets—**See Sets, Awl and Tool.

**Axes—**

Single Bit, base weights:  
First Quality.....\$6.75

Second Quality.....\$6.25

Double Bit, base weights:  
First Quality.....\$8.75

Second Quality.....\$8.25

**Axle Grease—**

See Grease, Axle

**Axles—**

Concord, Loose Collar.....4 1/2 @ 4 1/2

Concord, Solid Collar.....4 1/2 @ 4 1/2

No. 1 Common, Loose.....3 1/2 @ 3 1/2

No. 1 1/2 Com., New Styles.....4 1/2 @ 4 1/2

No. 2 Solid Collar.....4 1/2 @ 4 1/2

Half Patent:  
Nos. 7, 8, 11 and 12.....75 @ 75 & 5 %

Nos. 13 to 14.....70 @ 70 & 5 %

Nos. 15 to 18.....75 @ 75 & 10 & 5 %

Nos. 19 to 22.....75 @ 75 & 10 & 5 %

**Boxes, Axle—**

Common and Concord, not turned.....10 1/2 @ 10 1/2

Common and Concord, turned.....10 1/2 @ 10 1/2

Half Patent.....10 1/2 @ 10 1/2

**Bait—**

Hendry's:  
A Bait.....20 %

B Bait.....25 %

Competitor Bait.....20 & 5 %

**Balances—**

Caldwell new list.....50 %

Fulman.....50 & 10 @ 60

**Spring—**

Spring Balances.....50 @ 10 @ 60 %

Chatillon's:  
Light Spr. Balances.....40 & 10 %

Straight Balances.....40 %

Circular Balances.....40 %

Large Dial.....40 %

**Barb Wire—**See Wire, Barb.

**Bars—**

Steel Crowbars, 10 to 40 lb.....per lb. 5 1/2 @ 5 1/2

**Towel—**

No. 10 Ideal, Nickel Plate..... $\frac{1}{2}$  gro. \$5.50

**Beams, Scale—**

Scale Beams.....40 @ 10 @ 50 %

Chatillon's No. 1.....30 %

Chatillon's No. 2.....40 %

**Beaters, Carpet—**

Holt-Lyon Co.:  
No. 12 Wire Coppered  $\frac{1}{2}$  doz. \$0.55;

Tinned.....\$1.00

No. 11 Wire Coppered  $\frac{1}{2}$  doz. \$1.10;

Tinned.....\$1.20

No. 10 Wire Galvanized..... $\frac{1}{2}$  doz. \$1.75

Western W. G. Co.:  
No. 1 Electric..... $\frac{1}{2}$  gro. \$7.50

No. 2 Buffalo..... $\frac{1}{2}$  gro. \$9.00

No. 3 Perfection Dust..... $\frac{1}{2}$  gro. \$8.00

**Egg—**

Holt-Lyon Co.:  
Holt, No. A, Japanned..... $\frac{1}{2}$  doz. \$1.20

Holt, No. 1, Tinned..... $\frac{1}{2}$  doz. \$1.50

Holt, No. B, Japanned..... $\frac{1}{2}$  doz. \$2.00

Holt, No. 2, Tinned..... $\frac{1}{2}$  doz. \$2.25

Lyon, No. 2, Japanned..... $\frac{1}{2}$  doz. \$1.25

Lyon, No. 3, Japanned..... $\frac{1}{2}$  doz. \$1.50

Taplin Mfg. Co.:  
No. 60 Improved Dover..... $\frac{1}{2}$  gro. \$6.00

No. 75 Improved Dover.....\$6.50

No. 100 Improved Dover.....\$7.00

No. 102 Improved Dover, Tin'd.....\$8.50

No. 150 Improved Dover, Hotel.....\$15.00

No. 152 Imp'd Dover, Hotel, T'd.....\$17.00

No. 200 Imp'd Dover, Tumbler.....\$8.50

No. 222 Imp'd Dover, Tumbler, T'd.....\$9.50

No. 300 Imp'd Dover Mammoth.....\$25.00

dos.....\$25.00

Western W. G. Co., Buffalo.....\$7.00

Wonder (S. S. & Co.),  $\frac{1}{2}$  gro. net, \$6.00

**Bellows—**

Blacksmith, Standard List.....60 & 10 @ 70 & 10 %

**Hand—**

Inch.....6 7 8 9 10

Dos.....\$1.75 5.70 6.65 7.60 8.55

**Molders—**

Inch.....9 10 11 12 14

Dos.....\$3.00 9.00 10.50 12.50 14.50

**Bells—**

Ordinary goods.....75 & 5 @ 75 & 10 & 5 %

High grade.....70 & 10 @ 70 & 10 & 5 %

Jersey.....75 & 10 %

Texas Star.....50 %

**Door—**

Abbe's Gong.....45 %

Burton Gong.....50 %

Home, R. & E. Mfg. Co.'s.....55 & 10 %

Lever and Pull, Sargent's.....60 & 10 & 10 %

Trip Gong.....50 & 10 @ 50 & 10 & 5 %

Yankee Gong.....55 %

**Hand—**

Hand Bells, Polished, Brass.....60 & 5 @ 60 & 10 %

White Metal.....60 %

Nickel Plated.....50 & 10 @ 50 & 10 & 5 %

Sticks.....60 & 10 @ 60 & 10 & 5 %

Cone's Globe Hand Bells.....35 & 25 %

Silver Chime.....35 & 25 %

## Miscellaneous—

Farm Bells.....lb. 2 1/2 @

Steel Alloy Church and School.....50 & 10 @ 60 & 5 %

American Tube & Stamping Co.....75 %

Table Call Bells.....50 & 5 @ 10 %

**Belting—**

Extra Heavy, Short Lap.....60 & 5 %

Regular Short Lap.....60 & 10 & 5 %

Standard.....70 %

Light Standard.....70 & 5 %

Cut Leather Lacing.....60 %

Leather Lacing Slides, per sq. ft. 22¢

**Rubber—**

Agricultural (Low Grade).....75 @ 75 & 5 %

Common Standard.....70 @ 70 & 10 %

Standard.....60 & 5 @ 60 & 10 %

Extra.....60 @ 60 & 5 %

High Grade.....50 & 5 @ 50 & 10 %

**Bench Stops—**

See Stops, Bench

**Benders and Upsetters, Tire—**

Detroit Perfected Tire Bender.....40 %

Green River Tire Benders and Upsetters.....20 %

Detroit Stoddard's Lightning Tire Upsetters, No. 1, \$1.25; No. 2, \$1.35;

No. 3, \$1.50; No. 4, \$1.65; No. 5, \$2.00.

**Bicycle Goods—**

John S. Leung's Son's 1902 list:  
Chain.....50 %

Parts.....50 %

Spokes.....50 %

Tubes.....50 %

**Bits—**

Auger, Gimlet, Bit Stock Drills, &c.—See Augers and Bits.

**Blocks—**

Common Wooden.....70 & 10 @ 75 %

Harts St. Tackle Blocks.....50 & 5 @ 50 & 5 %

Hollow Steel Blocks, with Ford's Patent Sheaves.....50 & 10 %

Lane's Patent Automatic Lock and Junior.....30 %

Stowell's Novelty, Mal. Iron.....50 & 10 %

Stowell's Self Loading.....60 %

See also Machines, Hoisting.

**Boards, Stove—**

Zinc, Crystal, &c.....30 & 10 @ 40 & 10 %

**Boards, Wash—**

See Washboards.

**Bobs, Plumb—**

Keuffel & Esser Co.....50 & 5 %

**Bolts—**

Carriage, Machine, &c.—

Common Carriage (cut thread):  
% x 6 and Smaller.....75 & 10 %

Larger and Longer.....65 & 10 @ 75 & 10 %

Phila. Eagle \$3.00 list May 21, '99.....80 %

Bolt Ends, list Feb. 14, '95.....70 & 2 1/2 @ 10 %

Machine, % x 4 and smaller.....75 & 2 1

Hendryx Bronze: 700, 800 series. 40&10%  
Hendryx Knamed. 40&10%  
**Calipers—See Compasses.**  
**Calks, Toe and Heel—**  
Blunt, 1 prong. . . . . per lb. 44¢  
Sharp, 1 prong. . . . . per lb. 44¢  
Gautier, Blunt. . . . . 44¢  
Gautier, Sharp. . . . . 44¢  
Perkins, Blunt Toe. . . . . 44¢  
Perkins, Sharp Toe. . . . . 44¢

**Can Openers—**  
See Openers, Can.

**Cans, Milk—**  
5 8 10 gal.  
Illinois Pattern. . . . . \$1.35 1.85 2.05 each.  
New York Pattern. . . . . 1.50 2.20 2.45 each.  
Baltimore Pattern. . . . . 1.50 2.20 2.45 each.  
Dubuque. . . . . 1.35 1.90 1.75 each.

**Cans, Oil—**  
Buffalo Family Oil Cans:  
3 5 10 gal.  
\$18.00 60.00 129.00 gro., net.

**Caps, Percussion—**  
Eley's E. B. . . . . 50¢  
G. D. . . . . per M 34¢  
F. L. . . . . per M 40¢  
G. L. . . . . per M 40¢  
Musket . . . . . per M 68¢

**Primers—**  
Berdan Primers, 2¢ per M. . . . . 20%  
B. L. Caps (Starburst Shells). . . . . 20%  
2¢ per M. . . . . 20%  
All other primers per M. \$1.50 @ 1.60

**Cartridges—**  
Blank Cartridges:  
32 C. F. . . . . 10¢  
32 C. F. . . . . 10¢  
32 cal. Rim. . . . . 10¢  
32 cal. Rim. . . . . 10¢  
B. B. Caps, Con. Ball, Swg. . . . . \$1.90  
B. B. Caps, Round Ball. . . . . \$1.90  
Central Fire. . . . . 25¢  
Target and Sporting Rifle. . . . . 15¢  
Primed Shells and Bullets. . . . . 15¢  
Rim Fire, Sporting. . . . . 50¢  
Rim Fire, Military. . . . . 15¢

**Casters—**  
Bed . . . . . 70¢  
Plate . . . . . 60¢  
Philadelphia . . . . . 70¢  
Acme, Ball Bearing. . . . . 35¢  
Bons . . . . . 70¢  
Bons Anti-Friction. . . . . 70¢  
Gem (Roller Bearing). . . . . 80¢  
Martin's Patent (Phoenix). . . . . 45¢  
Standard Ball Bearing. . . . . 35¢  
Tucker's Patent low list. . . . . 35¢  
Yale (Double Wheel) low list. . . . . 50¢

**Cattle Leaders—**  
See Leaders, Cattle.  
**Chain, Coil—**  
American Coil, Straight Link:  
5-16 1/4 5-16 1/2 7-16 1/2 9-16  
\$7.95 5.50 4.50 3.85 3.70 3.60 3.55  
5/8 1/2 1 1 1/2 to 1 3/4 inch.  
\$3.50 3.50 3.35 3.15 per 100 lb.  
German Coil. . . . . 60¢  
**Halter—**  
Halter Chains. . . . . 60¢  
German Pattern Halter Chains.  
list July 23, '97. . . . . 60¢  
Covert Mfg. Co. . . . . 35¢  
Halter . . . . . 35¢  
Covert's Saddlery Works . . . . . 70¢

**Cow Ties—**  
See Halters and Ties.  
**Trace, Wagon, &c.—**  
Traces, Western Standard: 100 pr.  
6 1/2-6 3/4, Strght, with ring. \$23.50  
6 1/2-6 3/4, Strght, with ring. \$23.50  
6 1/2-6 3/4, Strght, with ring. \$23.50  
6 1/2-10-2, Strght, with ring. \$32.00  
NOTE—Add 2¢ per pair for Hooks.  
Twist Traces 2¢ per pair higher than  
Straight Link.  
**Trace, Wagon and Fancy**  
**Chains—** . . . . . 60¢  
**Miscellaneous—**  
Jack Chain, list July 10, '93:  
Iron . . . . . 60¢  
Brass . . . . . 60¢  
Safety Chain. . . . . 75¢  
Gal. Pump Chain. . . . . 10¢  
Covert Mfg. Co.:  
Breast . . . . . 35¢  
Heel . . . . . 35¢  
Helm . . . . . 35¢  
Stallion . . . . . 35¢  
Covert Sad. Works:  
Breast . . . . . 70¢  
Hold Back. . . . . 70¢  
Helm . . . . . 70¢  
Oneda Community:  
Am. Dog Leads and Kennel Chains.  
40¢  
Niagara Dog Leads and Kennel  
Chains. . . . . 45¢  
Wire Goods Co.:  
Dog Chain. . . . . 70¢  
Universal Dbl.-Jointed Chain. . . . . 50¢

**Chain and Ri-bon, Sash—**  
Oneda Community:  
Copper Chain. . . . . 60¢  
Steel Chain. . . . . 60¢  
Pullman:  
Bronze Chain. . . . . 60¢  
Steel Chain. . . . . 60¢  
Sash Chain Attachments, per set. 8¢  
Aluminum Sash Ribbon, per 100  
ft. . . . . \$1.25 @ 33¢  
Sash Ribbon Attachments, per set. 8¢  
**Chalk—** (From Jobbers.)  
Carpenters' Blue. . . . . 38¢  
Carpenters' Red. . . . . 35¢  
Carpenters' White. . . . . 28¢  
See also Crayons.

**Checks, Door—**  
Bardley's . . . . . 45¢  
Geline . . . . . 60¢  
Pullman, per gro. . . . . \$4.00  
Russwin . . . . . 40%

**Chests, Tool—**  
American Tool Chest Co.:  
Boy's Chests, with Tools. . . . . 50¢  
Yonial Chests, with Tools. . . . . 40¢  
Gentlemen's Chests, with Tools. . . . . 30¢  
Farmers' Carpenters', etc., Chests,  
with Tools. . . . . 20¢  
Machinists' and Pipe Fitters'  
Chests, Empty. . . . . 50¢  
Tool Cabinets. . . . . 50¢  
C. E. Jennings & Co.'s Machinists'  
Tool Chests. . . . . 33¢  
**Chisels—**  
Socket Framing and Firmer  
Standard List. . . . . 75¢  
Buck Bros. . . . . 30¢  
Charles Buck. . . . . 30¢  
C. E. Jennings & Co. Socket Firmer  
No. 10. . . . . 60¢  
C. E. Jennings & Co. Socket Fram-  
ing No. 15. . . . . 60¢  
Ohio Tool Co.'s. . . . . 70¢  
Swan's. . . . . 75¢  
L. & J. J. White. . . . . 30¢

**Tanged—**  
Tanged Firmers. 33 1-3 @ 33 1-3 @ 10%  
Buck Bros. . . . . 30¢  
Charles Buck. . . . . 30¢  
C. E. Jennings & Co. Nos. 191, 181, 25  
L. & J. J. White, Tanged. . . . . 25¢  
**Cold—**  
Cold Chisels, good quality. 13¢  
Cold Chisels, fair quality. 11¢  
Cold Chisels, ordinary. . . . . 9¢  
**Chucks—**  
Beach Pat., each \$8.00. . . . . 35¢  
Empire . . . . . 25¢  
Blacksmiths' . . . . . 25¢  
Jacobs' Drill Chucks. . . . . 25¢  
Pratt's Positive Drive. . . . . 25¢  
Skinner Patent Chucks. . . . . 25¢  
Independent Lathe Chucks. . . . . 50¢  
Universal . . . . . 50¢  
Combination . . . . . 50¢  
Drill Chucks, New Model. . . . . 30¢  
Drill Chucks, Standard. . . . . 45¢  
Drill Chuck, Skinner Pat., all sizes. 35¢  
Drill Chucks, Positive Drive. . . . . 30¢  
Planer Chucks. . . . . 25¢  
Face Plate Jaws. . . . . 40¢  
Standard Tool Co.:  
Improved Drill Chuck. . . . . 45¢  
Union Mfg. Co.:  
Combination . . . . . 50¢  
Czar Drill. . . . . 35¢  
Combination Geared Scroll. . . . . 40¢  
Geared Scroll. . . . . 40¢  
Independent . . . . . 50¢  
Independent Steel. . . . . 40¢  
Union Drill. . . . . 50¢  
Universal . . . . . 50¢  
Independent Iron & Plate Jaws. 40¢  
Independent Steel & Plate Jaws. 40¢  
Westcott Patent Chucks:  
Lathe Chucks. . . . . 50¢  
Little Giant Auxiliary Drill. . . . . 50¢  
Little Giant Double Grip Drill. . . . . 50¢  
Little Giant Drill, Improved. . . . . 50¢  
Onsida Drill. . . . . 50¢  
Scroll Combination Lathe. . . . . 50¢

**Clamps—**  
Adjustable, Hammers'. . . . . 20¢  
Cabinet, Sargent's. . . . . 20¢  
Carriage Makers', P. S. & W. Co. . . . . 10¢  
Carriage Makers', Sargent's. . . . . 10¢  
Realy, Parallel. . . . . 35¢  
Lineman's, Utica Drop Forge & Tool  
Co. . . . . 40¢  
Saw Clamps, see Vices, Saw Filers'.  
Wood Workers, Hammers'. . . . . 10¢

**Cleaners, Drain—**  
Iwan's Champion, Adjustable. . . . . 55¢  
Iwan's Champion, Stationary. . . . . 55¢  
**Sidewalk—**  
Star Socket, All Steel. 30 doz. \$4.05 net  
Star Shank, All Steel. 30 doz. \$3.24 net  
W. & C. Shank, All Steel, 1/2 doz.  
7 1/2 in. \$3.00; 8 in. \$3.25.

**Cleavers, Butchers—**  
Foster Bros. . . . . 30¢  
New Haven Edge Tool Co. . . . . 45¢  
Fayette B. Plumb. . . . . 33¢  
L. & J. J. White. . . . . 30¢  
**Clippers—**  
Chicago Flexible Shaft Company:  
'98 Chicago Horse. . . . . 15¢  
1902 Chicago Horse. . . . . 10¢  
20th Century Horse, each. . . . . 30¢  
Lightning Belt. . . . . 15¢  
Chicago Belt. . . . . 15¢  
Stewart's Patent Sheep. . . . . 20¢

**Clips, Axle—**  
Eagle, 5-16 and 3/4 in. . . . . 75¢  
Norway, 5-16 and 3/4 in. . . . . 10¢  
**Cloth and Netting, Wire**  
—See Wire, &c.  
**Cocks, Brass—**  
Hardware list:  
Compression, Plain Bibbs,  
Globe, Kerosene, Racking,  
&c., Cocks. . . . . 75¢  
**Coffee Mills—**  
See Mills, Coffee.

**Collars, Dog—**  
Nickel Chain, Walter B. Stevens &  
Son's list. . . . . 40¢  
Leather, Walter B. Stevens & Son's  
list. . . . . 40¢  
**Combs, Curry—**  
Metal Stamping Co. . . . . 40¢  
**Mane and Tail—**  
Covert's Saddlery Works. . . . . 60¢  
**Compasses, Dividers, &c.**  
Ordinary Goods. . . . . 75¢  
Bemis & Call Hdw. & Tool Co.:  
Dividers. . . . . 65¢  
Calipers, Double. . . . . 65¢  
Calipers, Inside or Outside. . . . . 65¢  
Calipers, Wing. . . . . 65¢  
Compasses. . . . . 65¢

**Conductor Pipe—**  
L. C. L. to Dealers:  
Territory. . . . . 70¢  
Eastern. . . . . 70¢  
Central. . . . . 70¢  
Southern. . . . . 70¢  
So. Western. . . . . 70¢

**Copper.** 14¢  
Eastern. . . . . 14¢  
Central. . . . . 14¢  
Southern. . . . . 14¢  
So. Western. . . . . 14¢  
Terms, 60 days; 2% cash 10 days. Factory  
shipments generally delivered.  
See also Eave Troughs.

**Coolers, Water—**  
Gal., each. 2 3 4 6 8  
Labrador. . . . . \$1.20 \$1.50 \$1.80 \$2.10 \$2.70  
Gal. . . . . 3 4 6 8 10  
Iceland, ea. \$1.30 \$2.10 \$2.40 \$3.00  
Gal. . . . . 2 3 4 6 8  
Galvanized, ea. \$1.85 \$2.00 \$2.25 \$2.50 \$3.00  
Galvanized, Lined, side handler.  
Gal. . . . . 2 3 4 6 8  
Each. . . . . \$1.95 \$2.15 \$2.40 \$3.30 \$4.15  
White Enameled. . . . . 25¢  
Agate Lined. . . . . 25¢

**Coopers' Tools—**  
See Tools, Coopers'.  
**Coppers' Soldering—**  
Soldering Coppers, 3 lbs. to pair  
and heavier, 20¢ @ 2 1/2¢; light-  
er than 3 lbs. to pair. 22¢ @ 2 1/2¢  
**Cord— Sash—**  
Braided, Drab. . . . . 10¢  
Braided, White, Com. Nos. 6  
to 12. . . . . 10¢  
Cable Laid Italian. . . . . 10¢  
lb., A, 18¢; B, 18¢  
Common India. . . . . 10¢  
Cotton Sash Cord, Twisted. 17¢  
Patent Russia. . . . . 10¢  
Cable Laid Russia. . . . . 10¢  
India Hemp, Braided. . . . . 10¢  
India Hemp, Twisted. . . . . 10¢  
Patent India, Twisted. . . . . 10¢  
Anniston, Nos. 7 to 12. . . . . 10¢  
Anniston, Nos. 8 to 12, 25¢; No. 7,  
23¢; No. 6, 24¢; Anniston  
Drab, Nos. 7 to 12, 10¢; 10 lb. 26¢;  
Anniston Mahogany, 27¢  
Pearl Braided, cotton, No. 6, 10 lb.  
24¢; No. 7, 23¢; No. 8 to 12, 23¢  
Edystone Braided, Nos. 8, 9 and  
10, 25¢; 7, 25¢; 6, 25¢  
Harmony Cable Laid Italian, Nos. 7  
to 10. . . . . 10¢  
Peerless:  
Cable Laid Italian. . . . . 10¢  
Cable Laid Russian. . . . . 10¢  
Braided India. . . . . 10¢  
Pullman:  
Wire Sash Cord. . . . . 10¢  
Sash Cord Attachments, per doz. 10¢  
Samson, Nos. 8 to 12. . . . . 10¢  
Braided, Drab Cotton. . . . . 10¢  
Braided, Italian Hemp. . . . . 10¢  
Braided, Linen. . . . . 10¢  
Braided, White Cotton or Spot. . . . . 10¢  
Massachusetts, White. . . . . 10¢  
Massachusetts, Drab. . . . . 10¢  
Pennix, White, Nos. 8 to 12, 24¢;  
No. 7, 24¢; No. 6, 25¢  
Silver Lake:  
A quality, Drab. . . . . 10¢  
A quality, White. . . . . 10¢  
B quality, Drab. . . . . 10¢  
B quality, White. . . . . 10¢  
Italian Hemp. . . . . 10¢  
Linen. . . . . 10¢  
See also Chain and Ribbon.

**Wire, Picture—**  
List Oct., '00. . . . . 85¢  
Hendryx Standard Wire Picture Cord.  
85¢  
**Cradles—**  
Grain . . . . . 40¢  
**Crayons—**  
White Round Crayons, gr. 6 @ 16¢  
Cases, 100 gro., \$5.00 at factory.  
D. M. Steward Mfg. Co.:  
Jumbo Crayons. . . . . 35¢  
Metal Workers' Crayons, gr. 25¢  
Soapstone Pencils, round, flat  
or square. . . . . \$1.50  
Rolling Mill Crayons. . . . . \$2.50  
Railroad Crayons (composition). . . . . \$2.00  
Zelnicke's Lumber:  
Red, Blue, Green. . . . . 30¢  
Black. . . . . 30¢  
See also Chalk.

**Crooks, Shepherds—**  
Fort Madison, Heavy. . . . . 30¢  
Fort Madison, Light. . . . . 30¢  
**Crow Bars—** See Bars, Croic.  
**Cultivators—**  
Victor Garden. . . . . 50¢  
**Cutlery, Table—**  
International Silver Company:  
No. 12 M'd'm Knives, 1847. 30 doz. \$3.50  
Star, Eagle, Rogers & Hamilton  
and Anchor. . . . . 30 doz. \$3.00  
Wm. Rogers & Son. . . . . 30 doz. \$2.50  
**Cutters—** Glass.  
H. H. Mayhew Co. . . . . 40¢  
Red Devil. . . . . 30¢  
Smith & Hemenway Co. . . . . 40¢  
Woodward. . . . . 40¢

**Meat and Food—**  
American. . . . . 30¢  
Nos. 1 2 3 4 B 5  
Each. . . . . \$5 \$7 \$10 \$25 \$50 \$60  
Enterprise. . . . . 25¢  
Nos. 5 10 12 22 32  
Each. . . . . \$2 \$3 \$2.75 \$1.50 \$6  
Dixon's. . . . . 10¢  
Nos. . . . . \$1.00 \$1.00 \$1.00 \$3.00  
Ideal. . . . . 40¢  
Little Giant. . . . . 40¢  
Nos. . . . . 30¢  
N. E. Food Choppers. . . . . 25¢  
New Triumph No. 605. 30 doz. \$24.00  
Russwin Food, No. 1. \$24.00; No. 2,  
\$27.00  
Woodruff's. . . . . 30 doz. 40¢  
Nos. . . . . 150  
Enterprise Beef Shavers. . . . . 25¢  
**Slaw and Kraut—**  
Henry Daston & Sons:  
Slaw, Corn Grater, &c. . . . . 40%

**Kraut Cutters, 24 x 7, 26 x 8, 30  
x 9. . . . . 35¢  
Kraut Cutters, 36 x 12, 40 x 12. . . . . 40¢  
J. M. Mast Mfg. Co.:  
Slaw Cutters, 1 Knife. . . . . 30¢  
Combined Slaw Cutter and Corn  
Grater. . . . . 40¢  
Tucker & Dorsey Mfg. Co.:  
Slaw Cutters, 1 Knife. . . . . 40¢  
Slaw Cutters, 2 Knives. . . . . 40¢  
Slaw Cutters, 2 Knives. . . . . 40¢**

**Tobacco—**  
All Iron, Cheap. doz. \$1.25 @ 1.50  
Enterprise. . . . . 25¢  
National, 3 doz., No. 1, \$21; No. 2,  
\$18  
Sargent's, 3 doz., No. 2. . . . . 40¢  
Appleton's, Nos. 12 and 21. . . . . 60¢  
**Washer—**  
Sargent's, 3 doz., \$16.00. . . . . 50¢

**Diggers, Post Hole, &c.—**  
Dalbey Post Hole Auger, per doz. \$9.00  
Iwan's Imp'd Post Hole Auger. 40¢  
Iwan's Vaughan Pattern Post Hole  
Augers. . . . . 25¢  
Iwan's Perfection Post Hole Digger. . . . . 25¢  
Iwan's Split Handle Post Hole Dig-  
gers. . . . . 25¢  
Kohler's Universal. . . . . 10¢  
Kohler's Little Giant. . . . . 10¢  
Kohler's Hercules. . . . . 10¢  
Kohler's Invincible. . . . . 10¢  
Kohler's Rival. . . . . 10¢  
Kohler's Pioneer. . . . . 10¢  
Never-Break Post Hole Diggers. . . . . 10¢  
Samson. . . . . 25¢

**Dividers—See Compasses.**  
**Doors, Screen—**  
Phillips, style E, 1/2 in. . . . . 10¢  
Phillips, style G, 1/2 in. . . . . 10¢  
Phillips, style X-Y, 1/2 in. . . . . 10¢  
**Drawers, Money—**  
Tucker's Pat. Alarm Till No. 1, 30  
doz., \$18; No. 2, \$15; No. 3, \$12;  
No. 4, \$18.  
**Drawing Knives—**  
See Knives, Drawing.

**Dressers, Emery Wheel—**  
Diamond Emery Wheel Dressers. . . . . 35¢  
Diamond Wheel Dresser Cutters. . . . . 35¢  
**Drills and Drill Stocks—**  
Common Blacksmiths' Drill,  
each. . . . . \$1.50 @ 1.75  
Breast, Millers Falls. . . . . 15¢  
Breast, P. S. & W. Co. . . . . 40¢  
Goodell Automatic Drills. . . . . 40¢  
Johnson's Automatic Drills, Nos. 2  
and 3. . . . . 16¢  
Johnson's Drill Points. . . . . 16¢  
Millers Falls Automatic Drills. 33¢  
Ratchet, Curtis & Curtis. . . . . 25¢  
Ratchet, Parker's. . . . . 10¢  
Ratchet, Weston's. . . . . 10¢  
Ratchet, Weston's, Style H Im-  
proved. . . . . 40¢  
Ratchet, No. 012. . . . . 40¢  
Ratchet, Whitney's, P. S. & W. 50¢  
Whitney's Hand Drill, No. 1, \$10.00;  
Adjustable, No. 1. . . . . 33¢

**Twist Drills**  
Bit Stock. . . . . 60¢  
Taper and Straight Shank. . . . . 60¢  
**Drivers, Screw—**  
Screw Driver Bits, per doz. 45¢ @ 60¢  
Bainey's Screw Holder and Driver. . . . . 25¢  
Buck Bros' Screw Driver Bits. . . . . 50¢  
Champion . . . . . 50¢  
Edson . . . . . 60¢  
Fray's Hol. H'dle Sets, No. 3, \$12.50  
Gay's Double Action. . . . . 35¢  
Goodell's Auto. 50¢  
Hurwood . . . . . 40¢  
Mayhew's Black Handle. . . . . 40¢  
Mayhew's Monarch. . . . . 40¢  
Millers Falls, Nos. 20 and 21. . . . . 25¢  
Millers Falls, No. 12, 11, 42. 15¢  
New England Specialty Co. . . . . 50¢  
Sargent & Co.'s:  
Nos. 1 and 60. . . . . 50¢  
Nos. 50, 53 and 55. . . . . 40¢  
Nos. 20 and 40. . . . . 40¢  
Smith & Hemenway Co. . . . . 40¢  
H. D. Smith & Co.'s Perfect H'dle. 40¢  
Stanley, B. & L. Co.'s:  
No. 64, Varn. Handles. . . . . 65¢  
No. 86. . . . . 75¢  
Victor . . . . . 55¢  
Defiance . . . . . 70¢  
Swan's:  
Nos. 7565 to 7568. . . . . 50¢  
No. 7540. . . . . 40¢

**Eave Trough, Galvanized—**  
Territory. . . . . L. C. L.  
Eastern. . . . . 80¢  
Central. . . . . 75¢  
Southern. . . . . 75¢  
So. Western. . . . . 75¢  
Terms—2% for cash. Factory ship-  
ments generally delivered.  
See also Conductor Pipe and Elbows.

**Elbows and Shoes—**  
Factory shipments, all territories:  
Galv. Steel and Galv. C. C.  
Iron and Steel, Standard  
Gauge. . . . . 60¢  
No. 26. . . . . 35¢  
No. 24. . . . . 25¢  
No. 22. . . . . 15¢  
Copper. . . . . 37¢  
Perfect Elbows (S. & C. Co.). . . . . 40¢  
**Emery, Turkish—**  
40¢ @ 5¢ to 180 Flour  
Kegs. . . . . 5¢  
1/4 Kegs. . . . . 5¢  
1/2 Kegs. . . . . 5¢  
10-lb. cans. . . . . 7¢  
10-lb. cans, less  
than 10. . . . . 10¢  
Less quantity. . . . . 10¢  
NOTE—In lots 1 to 3 tons a discount  
of 10% is given.

**Extractors, Lemon Juice**  
—See Squeezers, Lemon.

**Fasteners, Blind—**

|             |         |
|-------------|---------|
| Zimmerman's | 50c/10c |
| Walling's   | 40c/10c |

**Cord and Weight—**

|      |     |
|------|-----|
| Ives | 40c |
|------|-----|

**Faucets—**

|            |             |
|------------|-------------|
| Cork Lined | 50c/50c/10c |
|------------|-------------|

|                             |             |
|-----------------------------|-------------|
| Metallic Key, Leather Lined | 60c/10c/70c |
|-----------------------------|-------------|

|           |             |
|-----------|-------------|
| Red Cedar | 40c/10c/50c |
|-----------|-------------|

|           |             |
|-----------|-------------|
| Petroleum | 70c/10c/75c |
|-----------|-------------|

|                |         |
|----------------|---------|
| B. & L. B. Co. | 60c/10c |
|----------------|---------|

|           |         |
|-----------|---------|
| Metal Key | 60c/10c |
|-----------|---------|

|      |         |
|------|---------|
| Star | 60c/10c |
|------|---------|

|           |         |
|-----------|---------|
| West Lock | 50c/10c |
|-----------|---------|

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| John Sommer's Peerless Tin Key | 50c/10c |
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| John Sommer's Boss Tin Key | 50c/10c |
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| John Sommer's Victor Mtl. Key | 50c/10c |
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| John Sommer's Duplex Metal Key | 60c/10c |
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| John Sommer's Diamond Lock | 50c/10c |
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| John Sommer's I.X.L. Cork Lined | 50c/10c |
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| John Sommer's Reliable Cork Lined | 50c/10c |
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| John Sommer's Chicago Cork Lined | 50c/10c |
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| John Sommer's O. K. Cork Lined | 50c/10c |
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| John Sommer's No Brand, Cedar | 50c/10c |
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| John Sommer's Perfection, Cedar | 50c/10c |
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| McKenna, Brass | 50c/10c |
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| Burglar Proof, N. P. | 50c/10c |
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| Improved, 3/4 and 1/2 inch | 50c/10c |
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| Self Measuring | 50c/10c |
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**Glue, Liquid Fish—**

|                             |         |
|-----------------------------|---------|
| Bottles or Cans, with Brush | 25c/50c |
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|---|---------|
| Cans (1/2 pts., pts., qts., 1/2 gal., gal.) | 25c/48c |
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|-----------------------------------|-----|
| International Glue Co. (Martin's) | 40c |
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**Grease, Axle—**

|              |             |
|--------------|-------------|
| Common Grade | 50c/50c/50c |
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| Dixon's Everlasting, 10-lb pails | 85c |
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| Dixon's Everlasting, 10 |
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**Wrought Iron Hinges—**  
Strap and T Hinges, do., list  
December 20, 1904:

|   |                           |   |
|---|---------------------------|---|
| Light Strap Hinges.....70%              | Extra<br>10 to 10 1/2 in. | Light Strap Hinges.....70%              |
| Heavy Strap Hinges.....65%              |                           | Heavy Strap Hinges.....65%              |
| Light T Hinges.....75%                  |                           | Light T Hinges.....75%                  |
| Heavy T Hinges.....70%                  |                           | Heavy T Hinges.....70%                  |
| Extra H T Hinges.....70%                |                           | Extra H T Hinges.....70%                |
| Hinge Hasps.....50%                     |                           | Hinge Hasps.....50%                     |
| Cor. Heavy Strap.....75%                |                           | Cor. Heavy Strap.....75%                |
| Cor. Heavy T.....75%                    |                           | Cor. Heavy T.....75%                    |
| Screw Hook.....10 to 12 in. 1b. 3 1/2   |                           | Screw Hook.....10 to 12 in. 1b. 3 1/2   |
| and Strap.....1 1/2 to 20 in. 1b. 3 1/2 |                           | and Strap.....1 1/2 to 20 in. 1b. 3 1/2 |

**Screw Hook and Eye.**  
3/4 to 1 inch.....1b. 6  
1/2 inch.....1b. 7  
1/4 inch.....1b. 9

**Hitchers, Stall—**  
Covert Mfg. Co., Stall Hitchers.....35%

**Hods—Coal—**

|                                      |          |
|--------------------------------------|----------|
| Inch.....15 18 21                    | Per doz. |
| Galv. Open.....\$2.50 2.75 3.00 3.25 |          |
| Jap. Open.....\$1.90 2.10 2.25 2.35  |          |
| Galv. Full.....\$3.00 3.30 3.60 3.90 |          |
| Jap. Full.....\$2.15 2.65 2.85 3.30  |          |

**Masons' Etc.—**  
Avery-Caldwell Mfg. Co.:

|                                      |
|--------------------------------------|
| Steel Brick.....each \$1.00          |
| Steel Mortar.....each \$1.25         |
| Cleveland Wire Spring Co.:           |
| Steel Brick, No. 16.....each \$0.95  |
| Steel Mortar, No. 15.....each \$1.25 |

**Hoes—Eye—**  
Scovill and Ocal Pattern.....

60 to 100 @ 60 to 100 10%

Grub, list Feb. 23, 1899.....

70 to 100 @ 75 to 100 10%

D. & H. Scovill.....33 1/2%

**Handled—**

NOTE—Manufacturers are selling from the 1st of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Cronk's Weeding No. 1, \$2.00; No. 2, \$2.25

Ft. Madison Cotton Hoe.....70 to 100 10%

Ft. Madison Crescent Cultivator Hoe.....70 to 100 10%

Ft. Madison Mattock Hoes.....70 to 100 10%

Regular Weight.....70 to 100 10%

Junior Size.....70 to 100 10%

Ft. Madison Sprouting Hoe.....70 to 100 10%

Ft. Madison Dixie Tobacco Hoe.....70 to 100 10%

Kretzinger's Cut Easy.....70 to 100 10%

Warren Hoe.....70 to 100 10%

W. & C. Ivanhoe.....70 to 100 10%

B. B. & Co., Cultivator Hoe.....70 to 100 10%

B. B. & Co., Hoe.....70 to 100 10%

Acme Weeding.....70 to 100 10%

W. & C. L'ing Shuffle Hoe.....70 to 100 10%

**Hoisting Apparatus—**  
See Machines, Hoisting.

**Holders—Bit—**

Angular, 7/8 doz. \$24.00.....45 to 10%

**Door—**

Bardsley's.....45%

Empire.....50%

Pullman.....50%

**File and Tool—**

Nicholson File Holders and File Handles.....33 1/2 to 40%

**Fruit Jar—**

Triumph Fruit Jar Holder, 7/8 gross, \$10.80; 7/8 doz. \$11.25

**Hones—Razor—**

Pike Mfg. Co., Belgian, German and Swak.....50%

**Hooks—Cast Iron—**

Bird Cage, Reading.....40%

Bird Cage, Sargent's List.....60 to 10%

Ceiling, Sargent's List, Nos. 29, 32, 33, 129, 132, 133 and 135.....50 to 10 to 10%

Clothes Line, Reading List.....40%

Clothes Line, Sargent's List.....50 to 20 to 10%

Coat and Hat, Sargent's List.....50 to 10%

Clothes Line, Stowell's.....70%

Coat and Hat, Reading.....45 to 20%

Coat and Hat, Stowell's.....70%

Coat and Hat, Wrightville.....65%

Harness, Reading List.....40%

Harness, Stowell's.....60%

School House, Stowell's.....70%

**Wire—**

Belt.....80 to 100 10%

Wire C. & H. Hooks.....75 to 100 to 75 to 100 10%

Columbia Wire Co., Gem.....70 to 10%

Parker Wire Goods Co., King.....75 to 10%

Van Wagner, Coat and Hat.....70%

Western W. O. Co., Molding.....75%

Wire Goods Co.:

Acme.....60 to 100 10%

Chief.....70%

Crown.....75%

Crown.....75%

Crown.....75%

Crown.....75%

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Slater's Felt (roll 500 sq. ft.) .75¢  
R. R. M. Stone Surfaced Roofing  
(roll 110 sq. ft.) .52¢

### Sand and Emery—

Flint Paper and Cloth .60¢ to .60¢  
Garnet Paper and Cloth .25¢  
Emery Paper and Cloth .50¢ to .60¢

### Parers—Apple—

Advance . . . . . doz. \$4.00  
Baldwin . . . . . doz. \$4.00  
Bonanza Improved . . . . . doz. \$6.50  
Daisy . . . . . doz. \$4.00  
Dandy . . . . . doz. \$7.50  
Eureka Improved . . . . . doz. \$20.00  
Family Bay State . . . . . doz. \$15.00  
Improved Bay State . . . . . doz. \$36.00  
Little Star . . . . . doz. \$5.00  
New Lightning . . . . . doz. \$7.00  
Reading 12 . . . . . doz. \$3.25  
Reading 16 . . . . . doz. \$6.25  
Rocking Table . . . . . doz. \$6.25  
Turn Table . . . . . doz. \$6.00  
White Mountain . . . . . doz. \$5.00

### Potato—

Saratoga . . . . . doz. \$7.00  
White Mountain . . . . . doz. \$6.00

### Picks and Mattocks—

List Feb 23, 1899 . . . . . 75¢ to 75¢  
Cronk's Handled Garden Mattock,  
doz., \$6.40 . . . . . 33%  
Pinking Irons—  
See Irons, Pinking.

### Pins, Escutcheon—

Brass . . . . . 60¢ to 60¢  
Iron, list Nov. 11, '85 . . . . . 60¢ to 60¢

### Pipe, Cast Iron Soil—

Carload lots.  
Standard, 2-6 in. . . . . 60%  
Extra Heavy, 2-5 in. . . . . 70%  
Fittings . . . . . 75%

### Pipe, Merchant—

Carload Lots.  
Steel.  
Bk. Galv. Bk. Galv.  
1/4 & 1/2 in. . . . . 67% 51% 63% 49%  
3/4 & 1 in. . . . . 71% 55% 69% 57%  
1 & 1 1/2 in. . . . . 75% 59% 73% 63%  
7 to 12 in. . . . . 70% 55% 68% 63%

### Pipe, Vitrified Sewer—

Carload lots.  
Standard Pipe and Fittings, 2  
to 24 in. . . . . 68%  
New England . . . . . 71%  
New York and New Jersey . . . . . 71%  
Maryland, Delaware, E. Pa. . . . . 71%  
West. Pa. and West Va. . . . . 71%  
Virginia . . . . . 71%  
Ohio, Michigan and Ky. . . . . 71%  
Indiana . . . . . 71%  
NOTE—Carload lots are generally delivered.

### Pipe, Stove—

Edwards' Nested Stove Pipe:  
C. L. L. C. L.  
5 in., per 100 joints . . . . . \$7.00 \$8.00  
6 in., per 100 joints . . . . . 7.50 8.50  
7 in., per 100 joints . . . . . 8.50 9.50

### Planes and Plane Irons—

Wood Planes—  
Bench, first qual. . . . . 40¢ to 10%  
Bench, second qual. . . . . 50¢ to 10%  
Molding . . . . . 35¢ to 10%  
Bailey's (Stanley R. & L. Co.) . . . . . 40%  
Chapin-Stephens Co.:  
Bench, First Quality . . . . . 40¢ to 10%  
Bench, Second Quality . . . . . 50¢ to 10%  
Molding . . . . . 35¢ to 10%  
Adjustable Wood Bottom . . . . . 60%  
Union . . . . . 60%  
Iron Planes—  
Bailey's (Stanley R. & L. Co.) . . . . . 40%  
Chapin's Iron Planes . . . . . 50¢ to 10%  
Miscellaneous Planes (Stanley R. & L. Co.) . . . . . 35%  
Ohio Tool Co.'s Iron Planes . . . . . 60%  
Sargent's . . . . . 60¢ to 10%  
Union . . . . . 60%  
Plane Irons—  
Wood Bench Plane Irons—  
25¢ to 10%  
Buck Bros. . . . . 30%  
Chapin-Stephens Co. . . . . 30% to 10%  
Ohio Tool Co. . . . . 35%  
Stanley B. & L. Co. . . . . 50%  
Union . . . . . 50%  
L. & J. White . . . . . 20¢ to 25%

### Planters, Corn, Hand—

Kohler's Eclipse . . . . . doz. \$3.50  
Plates—  
Felloe . . . . . lb. 3¢ to 4¢  
Self-Sealing Pie Plates (S. & Co.) . . . . . doz. \$2.00 . . . . . 50%  
Pliers and Nippers—  
Button Pliers . . . . . 75¢ to 10% to 80%  
Gas Burner, per doz. 5 in. . . . . \$1.25  
@ \$1.30; 6 in. . . . . \$1.45 @ \$1.50.  
Gas Pipe . . . . . 7 8 10 12 in.  
Acme Nippers . . . . . \$2.00 \$2.25 \$3.00 \$3.75  
Cronk & Carrier Mfg. Co.:  
American Button . . . . . 75¢ to 10%  
Cronk's . . . . . 60%  
Stub's Pattern . . . . . 50%  
Combination and others . . . . . 35%  
Heller's Farriers' Nippers, Pincers  
and Tools . . . . . 40¢ to 10% to 10% to 10%  
P. S. & W. Tinnors' Cutting Nippers  
Swedish Side, End and Diagonal Cutting  
Pliers . . . . . 50%  
Utica Drop Forge & Tool Co.:  
Pliers and Nippers, all kinds . . . . . 40%

### Plumb and Levels—

Chapin-Stephens Co.:  
Plumb and Levels . . . . . 30¢ to 10% to 10%  
Chapin's Imp. Brass Cor. . . . . 40¢ to 10% to 10%  
Pocket Levels . . . . . 30¢ to 10% to 10%  
Diamon's Plumb and Levels . . . . . 70%  
Diamon's Pocket Levels . . . . . 70%  
C. E. Jennings & Co.'s Iron . . . . . 35%  
C. E. Jennings & Co.'s Iron, Adjustable  
Stanley R. & L. Co. . . . . 40¢ to 10%  
Stanley's Duplex . . . . . 35%  
Woods' Extension . . . . . 33%  
Poachers, Egg—  
Buffalo Steam Egg Poachers, doz.  
No. 1, \$6.00; No. 2, \$9.00; No. 3,  
\$9.00; No. 4, \$12.00 . . . . . 50%  
Points, Glaziers—  
Bulk and 1-lb. papers, lb. 8 1/2¢ to 9¢  
1/4-lb. papers . . . . . lb. 9¢ to 10 1/2¢  
1/2-lb. papers . . . . . lb. 9 1/2¢ to 10 1/2¢  
Pokes, Animal—  
Ft. Madison Hawkeye . . . . . doz. \$3.25  
Ft. Madison Western . . . . . doz. \$3.25  
Police Goods—  
Manufacturers' Lists . . . . . 25¢ to 25¢  
Tower's . . . . . 25%  
Polish—Metal, Etc—  
Glasbrite, No. 2, 5 lb. can (powder),  
each, \$1.25; doz. \$12.00; No. 2, 10 lb.  
can (cake), each, \$2.50; doz. \$24.00.  
Prestoline Liquid, No. 1 (1/2 pt.) . . . . . 40%  
Prestoline Paste . . . . . 40%  
George William Hoffman's:  
U. S. Metal Polish Paste, 3 oz.  
boxes, doz. \$5.00; 1 lb. doz. \$4.50.  
1/2 lb. boxes, doz. \$2.25.  
U. S. Liquid, 8 oz. cans, doz.  
\$1.25; doz. \$12.00.  
Barkeepers' Friend Metal Polish,  
doz. \$1.75; doz. \$18.00.  
Wynn's White Silk, 1/2 pt. cans, doz.  
doz. . . . . \$2.00  
Stove—  
Black Eagle Benzine Paste, 5 lb. cans,  
doz. \$10.40  
Black Eagle, Liquid, 1/2 pt. cans,  
doz. \$7.50  
Black Jack Paste, 1/4 lb. cans, doz. \$9.00  
Ladd's Black Beauty Liquid, per  
10 tins . . . . . \$4.75  
Joseph Dixon's, doz. \$5.75; doz. \$5.75  
Dixon's Plumbago . . . . . doz. \$2.50  
Fireside . . . . . doz. \$2.50  
Gem, doz. \$1.50 . . . . . 10%  
Japanese . . . . . doz. \$3.50  
Jet Black . . . . . doz. \$3.50  
Peerless Iron Enamel, 10 oz. doz. \$1.50  
Wynn's:  
Black Silk, 5 lb. box . . . . . each \$0.40  
Black Silk, 1/2 lb. box . . . . . doz. \$1.00  
Black Silk, 5 oz. box . . . . . doz. \$0.75  
Black Silk, 1/2 pt. liq. . . . . doz. \$1.00  
Poppers, Corn—  
1 qt., Square . . . . . gro. \$9.00  
1 qt., Round . . . . . gro. \$10.00  
1/2 qt., Square . . . . . gro. \$11.00  
2 qt., Square . . . . . gro. \$13.00  
Post Hole and Tree Aug-  
ers and Diggers—  
See also Diggers, Post Hole, &c.  
Posts, Steel—  
Steel Fence Posts, each, 5 ft., 42¢;  
6 ft., 46¢; 6 1/2 ft., 48¢  
Steel Hitching Posts . . . . . each \$1.30  
Potato Parers—  
See Parers, Potato.  
Pots, Glue—  
Enamelled . . . . . 40%  
Tinned . . . . . 35%  
Powder—  
In Canisters:  
Duck, 1 lb. . . . . each 45¢  
Fine Sporting, 1 lb. . . . . each 75¢  
Rifle, 1/2 lb. . . . . each 15¢  
Rifle, 1 lb. . . . . each 25¢  
In Kegs:  
12 1/2-lb. kegs . . . . . \$3.50  
25-lb. kegs . . . . . \$4.50  
King's Semi-Smokeless:  
Keg (25 lb. bulk) . . . . . \$6.50  
Half Keg (12 1/2 lb. bulk) . . . . . \$3.50  
Quarter Keg (6 1/2 lb. bulk) . . . . . \$1.90  
Case 24 (1 lb. cans bulk) . . . . . \$3.50  
Half case (1 lb. cans bulk) . . . . . \$4.50  
King's Smokeless: Shot Gun. Rifle.  
Keg (25 lb. bulk) . . . . . \$12.00 \$15.00  
Half Keg (12 1/2 lb. bulk) . . . . . 6.25 7.75  
Quarter Keg (6 1/2 lb. bulk) . . . . . 3.25 4.00  
Case 24 (1 lb. cans bulk) . . . . . 14.00 17.00  
Half case 12 (1 lb. c. bk.) . . . . . 7.25 8.75  
Robin Hood Sm'less Shot Gun. 30 & 20.  
Presses—  
Fruit and Jelly—  
Enterprise Mfg. Co. . . . . 30¢ to 25%  
Seal Presses—  
Morrill's No. 1, Hook and Shears  
See Shears.  
Pullers, Cork—  
Invincible Cork Puller . . . . . \$21.00  
Pullers, Nail—  
Cyclops . . . . . 50%  
Miller's Palla, No. 2, doz. . . . . 35% to 10%  
Morrill's No. 1, Nail Puller, doz. . . . . 50%  
Pearson No. 1, Cyclone Spike Puller,  
each \$30.00 . . . . . 50%  
Pelican . . . . . doz. \$2.00 40¢ to 10%  
Scranton, Case Lots:  
No. 2B (large) . . . . . \$5.50  
No. 3B (small) . . . . . \$5.00  
Smith & Hemenway Co.:  
Diamond B, No. 2, case lots . . . . . \$6.00  
Diamond B, No. 3, case lots . . . . . \$5.50  
Giant No. 1, doz. \$18; No. 2,  
\$16.50; No. 3, \$15 . . . . . 35%  
Staple Pullers . . . . . 60%  
Parrot Tack and Stud Puller, doz.  
\$5.00 . . . . . 75% to 30%  
Pulleys, Single Wheel—  
Inch . . . . . 1 1/2 2 3  
Acting or Tackle,  
doz. . . . . \$0.30 15 60 1.05  
Hay Fork, Sichel or Solid Eye,  
doz., 4 in. . . . . \$1.25 5 in. . . . . \$1.55  
Hot . . . . . 2 1/2 3 4  
Hot House, doz. . . . . \$0.65 1 1/2 1.80  
Inch . . . . . 1 1/2 2 3  
Screw, doz. . . . . \$0.20 19 23 30  
Queen City Lawn, doz. 20 teeth,  
\$3.45; 24, \$3.60 . . . . . net.  
Anticlog Lawn, doz. . . . . \$4.00  
Malleable Garden . . . . . 70¢ to 10%  
Kohler's:  
Lawn Queen, 20-tooth . . . . . doz. \$3.45  
Lawn Queen, 24-tooth . . . . . doz. \$3.60  
Paragon, 20-tooth . . . . . doz. \$2.75  
Paragon, 24-tooth . . . . . doz. \$3.00  
Steel Garden, 14-tooth . . . . . doz. \$2.40  
Malleable Garden, 14-tooth . . . . . doz. \$1.75 to 2.00  
Weldless Steel Garden . . . . . 75¢ to 5%  
Rasps, Horse—  
Dieston's . . . . . 75%  
Heller Bros. . . . . 70¢ to 10% to 10%  
McCaffrey's American 8 1/2 in. . . . . 60¢ to 10%  
New Nicholson . . . . . 70¢ to 10% to 75%  
See also Files.  
Razors—  
Boras-I C. . . . . 60%  
Fox Razors, No. 22, doz. \$20.00  
Fox Razors, No. 44, doz. \$20.00  
Fox Razors, No. 82, Platina . . . . . 10%  
Red Devil . . . . . 50%  
Silberstein:  
Carbo Magnetic . . . . . \$18.00  
Grifton, No. 65 . . . . . \$15.00  
Grifton, No. 60 . . . . . \$12.00  
All other Razors . . . . . 40%  
Safety Razors—  
40%  
Reels, Fishing—  
Hendryx:  
M. G. Q. 6, A. B. 6, M. 9 1/4, M. 16,  
Q. 16, A. 16, B. 16, 4008, Rubber,  
Populo, Nickelled Populo . . . . . 20%  
Aluminum German 4 1/2 in. Bronze 25%  
1240 N. 124 N. . . . . 20%  
3004 N. 6 N. 6 RM. G. 9 . . . . . 20%  
4 N. 6 FN. 24 N. 20 FN. . . . . 20%  
2904 P. 2904 N. 2904 FN. . . . . 33%  
0224 N. . . . . 33%  
0204 N. . . . . 33%  
02304 PN. . . . . 33%  
802 N. . . . . 33%  
902 N. . . . . 33%  
5009 PN. 5009 N. . . . . 20%  
Competitor 102 P. 102 PN. 302 P.  
202 PN. 102 PR. 302 PR. . . . . 20%  
304 P. 304 PN. 0304 P. 0304 PN. 33%  
Registers—List July 1, 1903.  
Japanned, Electroplated and  
Bronzed . . . . . 70¢ to 10%  
Bronzed . . . . . 75%  
Revolvers—  
Single Action . . . . . 95¢ to \$1.00  
Double Action, except 4 in. cal. \$1.85  
Double Action, 4 1/2 caliber . . . . . \$2.00  
Automatic . . . . . \$3.45  
Hammerless . . . . . \$4.00  
Thayer Robertson & Cary:  
Automatic . . . . . each \$2.75  
Hammerless . . . . . each \$3.25  
Riddles, Hardware Grade  
16 in. . . . . per doz. \$2.25 to \$2.50  
17 in. . . . . per doz. \$2.50 to \$2.75  
18 in. . . . . per doz. \$2.75 to \$3.00  
Rings and Ringers—  
Bull Rings—  
2 1/2 3 inch.  
Steel . . . . . \$0.70 0.75 0.80 doz.  
Copper . . . . . 1.00 1.15 1.40 doz.  
Rea's Improved Self-Piercing Cop-  
per, 2 in. . . . . \$1.25; 2 1/2 in.,  
\$1.50; 3 in., \$1.75.  
Hog Rings and Ringers—  
Hill's Rings, gro. boxes \$1.00 to \$1.50  
Hill's Ringers, Gray Iron . . . . . doz. \$0.50 to 55¢  
Hill's Ringers, Malleable Iron . . . . . doz. 70¢ to 75¢  
Blair's Rings . . . . . per gro. \$1.75 to \$2.25  
Blair's Ringers . . . . . per gro. \$0.60 to .65  
Brown's Rings . . . . . per gro. \$0.50 to \$0.55  
Brown's Ringers . . . . . per doz. \$0.60 to .65  
Rivets and Burrs—  
Copper . . . . . 50¢ to 10% to 10% to 5%  
Iron or Steel . . . . . 75¢ to 75¢ to 5%  
Rollers—  
Acme, Stowell's Anti-Friction . . . . . 50%  
Barn Door, Sargent's list . . . . . 60%  
Cronk's Stay No. 65, \$0.90; No.  
50 . . . . . \$1.00  
Cronk's Brinkerhoff No. 55, \$0.60;  
No. 56 . . . . . \$0.80  
Lane's Stay . . . . . 40%  
Richards' Stay:  
Handy Adj. and Reversible No. 53 7/8  
O. K. Adj. and Reversible No. 58 5/8  
Lag Screw, Nos. 55 and 57 . . . . . 50%  
Underwriters', Nos. 55, 56, 57 . . . . . 50%  
Favorite No. Duro Stay . . . . . 50%  
Stowell's Barn Door Stay . . . . . 50%  
Swett's Anti-Friction . . . . . 50%  
Screw and Spike Stay . . . . . doz. 65¢  
Hinge Adjustable Stay . . . . . doz. 90¢  
Rope—  
Manila, 7-16 in. diam. and larger:  
Pure . . . . . lb. 11¢ to 12¢  
Sisal, 7-16 in. diam. and larger:  
Pure . . . . . lb. 9¢ to 10¢  
Sisal, Hay, Hide and Bale  
Ropes, Medium and Coarse:  
Mixed . . . . . lb. 8¢  
Pure . . . . . lb. 9¢  
Sisal, Tarred, Medium Lath  
Yarn:  
Mixed . . . . . lb. 7 1/4¢  
Pure . . . . . lb. 8 1/4¢  
Cotton Rope, on reels:  
1 lb.  
Best, 1/4-in. and larger, 16¢ to 18¢  
Medium, 1/4-in. and larger . . . . . 15¢ to 16¢  
Common, 1/4-in. and larger . . . . . 10¢  
In coils, 1/2¢ advance.  
Jute Rope:  
Thread No. 1, 1/4-in. & up, lb. 6¢ to 6¢  
Thread No. 2, 1/4-in. & up, lb. 5¢ to 5¢  
Old Colony Manila Transmission  
Rope . . . . . 25¢ to 17 1/2¢

### Wire Rope—

Galvanized ..... 12 1/2 @ 12 1/2 %  
Plain ..... 50 @ 2 1/2 %

### Ropes, Hammocks—

Covert Mfg. Co.: ..... 50 %  
Jute ..... 30 @ 10  
Sisal ..... 30 @ 10  
Covert Saddlery Works ..... 60 @ 5 %

### Rulers, Desk—

Stimpson & Son: ..... 30 @ 10 %  
Boxwood and Maple ..... 30 @ 10 %

### Rules—

Boxwood ..... 60 @ 10 @ 10 %  
Ivory ..... 35 @ 10 @ 35 @ 10 @ 5 %  
Chapin-Stephens Co.: ..... 60 @ 10 @ 10 %

Boxwood ..... 27 1/2 @ 10 @ 10 @ 2 1/2 %  
Flexfold ..... 30 @ 10 @ 10 %  
Ivory ..... 50 @ 50 @ 10 @ 10 %  
Miscellaneous ..... 50 @ 50 @ 10 @ 10 %  
Combination ..... 10 @ 10 @ 10 %  
Stationers ..... 10 @ 10 @ 10 %

Kaufel & Esau Co.: ..... 35 @ 10 %  
Folding, Wood ..... 33 1/2 @ 10 %  
Folding, Steel ..... 33 1/2 @ 10 %  
Lufkin's Steel ..... 50 @ 10 %  
Lufkin's Lumber ..... 60 @ 10 %

Stanley R. & L. Co.: ..... 62 1/2 %  
Boxwood ..... 45 %  
Ivory ..... 45 %  
Miscellaneous ..... 40 %  
Zig Zag ..... 40 %  
Zig Zag, Pin Joint ..... 42 1/2 %

Imson Nut Co.: ..... 60 @ 10 @ 10 %  
Boxwood ..... 35 @ 10 @ 35 @ 10 @ 10 %  
Ivory ..... 35 @ 10 @ 35 @ 10 @ 10 %

### Sash Balances—

See Balance, Sash.

### Sash Locks—

See Locks, Sash.

### Sash Weights—

See Weights, Sash.

### Sausage Stuffers or Fillers

See Stuffers or Fillers, Sausage.

### Saw Frames—

See Frames, Saw.

### Saw Sets—See Sets, Saw.

### Saw Tools—See Tools, Saw.

### Saws—

Atkins: ..... 50 %  
Circular ..... 50 @ 10 @ 50 %  
Band ..... 35 @ 5 %  
Cross Cuts ..... 50 %  
Mulay, Mill and Drag ..... 50 %  
One-Man Saw ..... 40 %  
Wood Saws ..... 40 %  
Hand, Compass, &c. .... 40 %

Chapin-Stephens Co.: ..... 30 @ 10 @ 10 %  
Turning Saws and Frames ..... 30 @ 10 @ 10 %  
Diamond Saw & Stamping Works: ..... 30 @ 10 @ 10 %  
Sterling Kitchen Saws ..... 30 @ 10 @ 10 %

Diston's: ..... 50 %  
Circular, Solid and Ins'ted Tooth ..... 50 %  
Band, 2 to 14 in. wide ..... 60 %  
Band, 2 to 1 1/2 in. wide ..... 60 %  
Crosscuts ..... 50 %  
Narrow Crosscuts ..... 50 %  
Mulay, Mill and Drag ..... 50 %  
Framed Woodsaws ..... 35 %  
Woodsaw Rods ..... 35 %

Woodsaw Rods ..... 35 %  
Hand Saws, Nos. 15, 99, 9, 16, 1100, 120, 126, 17, 8 ..... 25 %  
Hand Saws, Nos. 7, 107, 107 1/2, 3, 1, 0, 00, Combination ..... 25 %  
Compass, Key Hole, &c. .... 25 %  
Butcher Saws and Blades ..... 35 %

C. E. Jennings & Co.'s: ..... 25 %  
Back Saws ..... 30 %  
Butcher Saws ..... 30 %  
Compass and Key Hole Saws ..... 35 @ 5 %  
Framed Wood Saws ..... 30 %  
Hand Saws ..... 30 @ 2 1/2 %  
Wood Saw Blades ..... 35 %

Millers Falls: ..... 15 @ 10 %  
Butcher Saws ..... 15 @ 10 %  
Star Saw Blades ..... 15 @ 10 %  
Peace & Richardson's Hand Saws ..... 30 %  
Simonds: ..... 50 %

Circular Saws ..... 50 %  
Crescent Ground Cross Cut Saws ..... 35 %  
One-Man Cross Cuts ..... 40 @ 10 %  
Gang Mill, Mulay and Drag Saws ..... 50 %  
Band Saws ..... 50 %  
Back Saws ..... 25 @ 25 @ 1/2 %  
Butcher Saws ..... 35 @ 35 @ 1/2 %  
Hand Saws ..... 25 @ 25 @ 1/2 %  
Hand Saws, Bay State Brand ..... 45 %  
Compass, Key Hole, &c. .... 35 @ 35 @ 1/2 %  
Wood Saws ..... 35 @ 35 @ 1/2 %

Springfield Mach. Screw Co.: ..... 40 @ 10 @ 10 %  
Diamond Kitchen Saws ..... 40 @ 10 @ 10 %  
Butcher Saws and Blades ..... 35 @ 40 %  
Wheeler, Madden & Clemson Mfg. Co.'s Cross Cut Saws ..... 50 %

### Hack Saws—

Atkins' Hack Saw Blades A A A ..... 25 %  
Diston's: ..... 25 %  
Concave Blades ..... 25 %  
Keystone ..... 40 %  
Hack Saw Frames ..... 30 %  
Fitchburg File Works, The Best ..... 35 %  
C. E. Jennings & Co.'s ..... 35 %  
Hack Saw Frames, Nos. 175, 180, complete ..... 40 @ 7 1/2 %

Hack Saws, Nos. 175, 180, complete ..... 40 @ 7 1/2 %  
Goodell's Hack Saw Blades ..... 40 %  
Griffin's Hack Saw Frames ..... 35 @ 5 @ 10 %  
Griffin's Hack Saw Blades ..... 35 @ 5 @ 10 %  
Springfield Mach. Screw Co.: ..... 35 %  
Diamond Hack Saw Blades ..... 35 %  
Diamond Hack Saw Frames ..... 50 %  
Star Hack Saws and Blades ..... 15 @ 10 %  
Sterling Hack Saw Blades ..... 30 @ 10 @ 5 %  
Sterling Hack Saw Frames ..... 30 @ 10 @ 10 %  
Sterling Power Hack Saw Machines, each, No. 1, \$25.00; No. 2, \$30.00 ..... 10 %

### Scroll—

Barnes' No. 7, \$15 ..... 25 %  
Barnes' Scroll Saw Blades ..... 40 %  
Barnes' Velociped Power Scroll Saw, without boring attachment, \$18 ..... 25 %  
with boring attachment, \$20 ..... 25 %  
Lester, complete, \$10.00 ..... 15 @ 10 %  
Rogers, complete, \$1.00 ..... 15 @ 10 %

### Scalers, Fish—

Covert's Saddlery Works ..... 60 @ 10 %

### Scales—

Family, Turnbull's ..... 50 @ 50 @ 10 %

### Counter:

Hatch, Platform, 1/2 oz. to 4 lbs. ..... doz. \$5.50  
Two Platforms, 1/2 oz. to 8 lbs. ..... doz. \$16.00

Union Platform, Plain ..... \$1.70 @ 1.90  
Union Platform, Stpd. \$1.85 @ 2.15  
Chatillon's: ..... 25 %  
Eureka ..... 40 %  
Favorite ..... 40 %  
Crocker's Trip Scales ..... 50 %

Chicago Scale Co.: ..... 50 %  
The "Little Detective" ..... 25 @ 50 %  
Union or Family No. 2 ..... 50 %  
Portable Platform (reduced list) ..... 50 %  
Wagon or Stock (reduced list) ..... 25 @ 35 %  
"The Standard" Portables ..... 50 %  
"The Standard" R. R. and Wagon ..... 50 %

Scrapers—  
Box, 1 Handle ..... doz. \$2.00 @ 2.25  
Box, 2 Handle ..... doz. \$2.00 @ 2.85  
Ship, Light, \$2.00; Heavy, \$1.50  
Adjustable Box Scraper (S. R. & L. Co.) ..... \$6.00 ..... 45 %  
Chapin-Stephens Co., Box ..... 30 @ 30 @ 10 @ 10 %

Screens, Window and Frames—  
Air Line Pattern Screens ..... 60 @ 10 %  
Flyer Pattern Screens ..... 60 @ 10 @ 60 @ 10 @ 5 %  
Maine Screen Frames ..... 40 @ 10 @ 5 %  
Perfection Screens ..... 60 @ 10 @ 60 @ 10 @ 5 %  
Phillips' Screen Frames ..... 60 @ 5 @ 60 @ 10 %  
See also Doors.

Screws—Bench and Hand  
Bench, Iron, doz., 1 in. ..... \$2.50 @ 2.75  
2 1/2; 1 1/2, \$3.00 @ 3.25; 1 1/4, \$3.50 @ 3.75  
Bench, W'd. Beech, doz. ..... 30 @ 30 @ 5 %  
Hand, Wood ..... 40 @ 10 @ 50 %  
R. Bliss Mfg. Co., Hand ..... 30 @ 30 @ 10 %  
Chapin-Stephens Co., Hand ..... 30 @ 30 @ 10 %  
Ohio Tool Co., Bench and Hand ..... 30 %

Coach, Lag and Hand Rail—  
Lag, Cone Point, list Oct. 1, '99 ..... 75 @ 17 1/2 @ 10 %  
Coach, Gimlet Point, list Oct. 1, '99 ..... 75 @ 12 1/2 @ 10 %  
Hand Rail, list Jan. 1, '98 ..... 20 @ 10 @ 7 1/2 %

Jack Screws—  
Standard List ..... 75 @ 10 @ 80 @ 5 %  
Millers Falls ..... 50 @ 10 @ 10 %  
Millers Falls, Roller ..... 50 @ 10 %  
P. S. & W. .... 50 %  
Sargent ..... 70 @ 10 %  
Sweet Iron Works ..... 75 @ 10 @ 80 @ 5 %

Machine—  
List Jan. 1, '98:  
Flat or Round Head, Iron ..... 50 @ 50 @ 10 %  
Flat or Round Head, Brass ..... 50 @ 50 @ 10 %

Set and Cap—  
Set (Iron) ..... 80 %  
Set (Steel), net advance over Iron ..... 25 %  
Sq. Hd. Cap ..... 75 %  
Hex. Hd. Cap ..... 75 %  
Rd. Hd. Cap ..... 60 @ 10 %  
Fillister Hd. Cap ..... 60 @ 10 @ 10 %

Wood—  
List July 23, 1903:  
Flat Head, Iron ..... 87 1/2 @ 10 @ 1/2 %  
Round Head, Iron ..... 85 @ 10 @ 1/2 %  
Flat Head, Brass ..... 85 @ 10 @ 1/2 %  
Round Head, Brass ..... 80 @ 10 @ 1/2 %  
Flat Head, Bronze ..... 77 1/2 @ 10 @ 1/2 %  
Round Head, Bronze ..... 75 @ 10 @ 1/2 %  
Drive Screws ..... 87 1/2 @ 10 %

Scroll Saws—  
See Saws, Scroll.

Scythes—  
Prices announced for next season:  
Clipper Pattern, Grass ..... \$6.45  
Full Polished, Clipper ..... \$7.00  
Grain ..... \$8.25  
Clipper, Grain ..... \$8.50  
Wood and Bush ..... \$6.50

Seeders, Raisin—  
Enterprise ..... 25 @ 30 %

Sets—Awl and Tool—  
Aiken's Sets, Awl and Tools: ..... 60 @ 10 %  
No. 20, \$10.00 ..... 60 @ 10 %  
Fray's Adj. Tool Handles, Nos. 1, \$12; 2, \$18; 3, \$12; 4, \$8; 5, \$7 ..... 50 %  
C. E. Jennings & Co.'s Model Tool Holders ..... 30 %  
Millers Falls Adj. Tool Handles, No. 1, \$12; No. 4, \$12; No. 5, \$18 ..... 15 @ 10 %

Garden Tool Sets—  
Ft. Madison Three Flows Hoe, Rake and Shovel ..... 40 @ 25 @ 50 %

Sets, Nail—  
Octagon ..... gro. \$3.50 @ 3.75  
Buck Bros. .... 27 1/2 %  
Cannon's Diamond Point, \$10 ..... \$12.40  
Mayhew's ..... gro. \$9.00  
Snell's Corrugated, Cup Pt. ..... gro. \$7.20  
Snell's Knurled, Cup Pt. ..... gro. \$7.20  
Springfield Mach. Screw Co.: ..... \$1.20  
Diamond Knurled Cup Pt. ..... gro. \$7.50

Rivet—  
Regular list ..... 75 @ 75 @ 10 %

Saw—  
Aiken's: ..... 50 @ 10 %  
Genuine ..... 50 @ 10 %  
Imitation ..... 50 @ 10 %  
Atkin's: ..... 40 %  
Criterion ..... 40 %  
Adjustable ..... 40 %  
Bemis & Call Co.'s: ..... 30 %  
Cross Cut ..... 30 %  
Plate ..... 25 %  
Diston's Star and Monarch ..... 25 %  
Morrill's No. 1, \$15.00 ..... 50 %  
Nos. 3 and 4, Cross Cut, \$20.00 ..... 50 %  
No. 5, Mill, \$30.00 ..... 50 %  
Nos. 10, 11, 95, \$15.00 ..... 50 %  
No. 1 Old Style, \$10.00 ..... 50 %  
Special, \$16.25 ..... 50 %  
Giant Royal Cross Cut ..... \$1 doz. \$9.00  
Royal Hand ..... \$1 doz. \$4.50  
Taintor Positive ..... \$1 doz. \$2.75

Shaving  
Fox Shaving Sets, No. 30 ..... \$1 doz. net, \$24.00  
Smith & Hemenway Co.'s ..... 60 %

Sharpeners, Knife—  
Chicago Wheel & Mfg. Co. .... 70 %

### Pike Mfg. Co.:

Fast Cut Pocket Knife Hones ..... \$1.50  
Mounted Kitchen Sand Stone ..... \$1.50  
Natural Grit Carving Knife ..... \$3.00  
Hones, \$1 doz. ..... \$1.50  
Quick Cut Emery Carving Knife Hones, \$1 doz. ..... \$1.50  
Quick Edge Pocket Knife Hones, \$1 doz. ..... \$2.50

Skate—  
Smith & Hemenway Co. .... 20 %

Shaves, Spoke—  
Iron ..... doz. \$1.10 @ 1.25  
Wood ..... doz. \$1.75 @ 2.25  
Bailey's (Stanley R. & L. Co.) ..... 45 %  
Razor Edge (Stanley R. & L. Co.) ..... 35 %  
Chapin-Stephens Co. .... 30 @ 30 @ 10 @ 10 %  
Goodell's, \$1 doz. ..... 15 @ 10 %  
Wood's P1 and P2 ..... 50 %

Shears—  
Cast Iron, 7 8 9 in. ..... 18.00 20.00 gro.  
Best ..... \$13.00 15.00 17.00 gro.  
Good ..... \$5.00 6.00 7.00 gro.  
Straight Trimmers, &c.: ..... 70 @ 70 @ 10 %  
Best quality, Jap. .... 60 @ 60 @ 10 %  
Best quality, Nickel ..... 60 @ 60 @ 10 %  
Fair quality, Jap. .... 80 @ 80 @ 5 %  
Fair quality, Nickel ..... 75 @ 75 @ 10 %  
Tailors' Shears ..... 40 @ 40 @ 5 %  
Acme Cast Shears ..... 40 @ 40 @ 5 %  
Heinisch's Tailor's Shears ..... 10 %  
Wilkinson's Sheep, 1900 list ..... 50 @ 10 %

Tinners' Snips—  
Steel Blades ..... 20 @ 50 @ 20 @ 19 %  
Steel Laid Blades ..... 40 @ 10 @ 50 %  
Forged Handles, Steel Blades, Berlin, 50 @ 50 @ 5 %  
Heinisch's Snips ..... 40 %  
Jennings & Griffin Mfg. Co.'s, 6 1/2 to 10 in. .... 50 %  
Niagara Snips ..... 40 %  
P. S. & W. Forged Handles ..... 20 %

Pruning Shears—  
Cronk's Hand Shears ..... 33 1/2 %  
Cronk's Wood Handle Shears ..... 33 1/2 %  
Diskin's Combined Pruning Hook and Saw, \$1 doz. ..... 25 %  
Diskin's Pruning Hook, \$1 doz. ..... 25 %  
John T. Henry Mfg. Co.: ..... 50 @ 10 %  
Pruning Shears, all grades ..... 50 @ 10 %  
P. S. & W. Co. .... 33 1/2 %  
Wilkinson's Hedge, 1900 list ..... 50 @ 10 %  
Wilkinson's Lawn and Border ..... 50 %

Sheaves—Sliding Door—  
Stowell's Anti-Friction ..... 50 %  
Patent Roller, Hatfield's, Sargent's ..... 70 @ 40 %  
Reading list ..... 40 %  
R. & E. list ..... 33 1/2 %  
Wrightsville Hatfield Pattern ..... 80 %

Shells—Sliding Door—  
Reading list ..... 40 %  
R. & E. list ..... 33 1/2 %  
Sargent's list ..... 10 @ 10 %

Shells—Shells, Empty—  
Brass Shells, Empty: ..... 65 @ 10 %  
Climax, Club, Rival, 10 and 12 gauge ..... 65 @ 10 %  
Paper Shells, Empty: ..... 65 @ 10 %  
Acme, Ideal, Leader, New Rapid, Magic, 10, 12, 16 and 20 gauge ..... 25 @ 10 %  
Blue Rival, New Climax, Challenge, Monarch, Defiance, Repeater, Yellow Rival, 10, 12, 16 and 20 gauge ..... 20 @ 5 %  
Climax, Union, League, New Rival, 10 and 12 gauge ..... 25 @ 5 %  
Climax, Union, League, New Rival, 14, 16 and 20 gauge ..... 20 @ 5 %  
Expert, Metal Lined and Pigeon, 10, 12, 16 and 20 gauge ..... 33 1/2 @ 5 %  
Robin Hood, Low Brass ..... 20 @ 10 %  
Robin Hood, High Brass ..... 30 @ 10 %

Loaded with Black Powder, 10 %  
Loaded with Smokeless Powder, medium grade ..... 40 @ 5 %  
Loaded with Smokeless Powder, high grade ..... 40 @ 10 @ 10 %  
Robin Hood Smokeless Powder: ..... 50 %  
Comets, High Brass ..... 50 @ 10 @ 5 %

Shoes, Horse, Mule, &c.—  
F.A.B. Pittsburgh: ..... per keg \$1.00  
Steel ..... per keg \$3.75  
Burden's, all sizes ..... per keg \$3.90

Shot—  
Drop, up to B, 25-lb. bag ..... \$1.70  
Drop, B and larger ..... \$1.95  
Buck, 25-lb. bag ..... \$1.95  
Chilled, 25-lb. bag ..... \$1.95

Shovels and Spades—  
Association List, Nov. 15, 1902, 40 %

Sieves and Sifters—  
Hunter's Imitation ..... gro. \$10.50 @ 11.00  
Hunter's Genuine ..... per gro. \$12.00 @ 12.50  
Buffalo Metallic Blue, S. S. Co., \$1 gr.: ..... 14 @ 16 18 20  
\$13.20 ..... \$13.50 ..... \$14.40  
Shaker (Barler's Pat.) Flour Sifters, \$1 doz. ..... 20 %

Sieves, Seamless Metallic—  
Per dozen: ..... 14 16 18 20  
Iron Wire ..... \$1.05 1.05 1.10 1.20  
Tinned Wire ..... \$1.15 1.15 1.20 1.30

Sieves, Wooden Rim—  
Nested, 10, 11 and 12 in. .... \$1.00 @ 1.05  
Mesh 18, Nested ..... doz. \$0.90 @ 1.05  
Mesh 20, Nested ..... doz. \$1.00 @ 1.05  
Mesh 24, Nested ..... doz. \$1.30 @ 1.40

Sinks, Cast Iron—  
Standard list ..... 60 @ 60 @ 10 %  
Barnes' low list ..... 60 @ 5 %

NOTE—There is not entire uniformity in lists used by jobbers.

Skains, Wagon—  
Cast Iron ..... 80 @ 10 @ 80 @ 10 @ 10 %  
Steel ..... 40 @ 10 @ 10 %

### Slates, School—

Factory Shipments.  
"D" Slates ..... 50 @ 50 @ 10 %  
Eureka, Unexcelled Noiseless ..... 60 @ 5 tens

Victor A, Noiseless ..... 60 @ 4 tens @ 5 %

Slaw Cutters—See Cutters.

Snaps, Harness—  
German ..... 40 @ 40 @ 10 %  
Covert Mfg. Co.: ..... 30 @ 2 %  
Derby ..... 30 @ 2 %  
High Graue ..... 30 %  
Jockey ..... 30 %  
Trojan ..... 30 @ 2 %  
Yankee ..... 30 @ 2 %  
Yankee Roller ..... 30 @ 2 %  
Covert's Saddlery Works: ..... 60 %  
Crown ..... 60 %  
German ..... 60 %  
Model ..... 60 %  
Triumph ..... 60 %  
Oneida Community: ..... 60 %  
Harness Snaps, 1 in. .... 60 @ 5 %  
Swivel Snaps ..... 60 %  
Swivels ..... 50 %  
Sargent's Patent Guarded ..... 66 1/2 @ 10 %

Snaths—  
Scythe ..... 50 %

Snips, Tanners—See Shears.

Spoons and Forks—  
Silver Plated—  
Good Quality ..... 50 @ 10 @ 60 @ 5 %  
Cheap ..... 60 @ 60 @ 10 %  
International Silver Co.: ..... 60 @ 10 %  
1817 Rogers Bros. and Rogers & Hamilton ..... 40 @ 10 %  
Rogers & Bro., William Rogers ..... 50 @ 10 %  
Eagle Brand ..... 60 %  
Anchor ..... 60 %  
Wm. Rogers & Son ..... 60 @ 10 %

Miscellaneous—  
German Silver ..... 60 @ 60 @ 5 %  
Cattaraugus Cutlery Co.: ..... 50 %  
Seneca Silver ..... 50 %

Tinned Iron—  
Teas ..... per gro. 45 @ 50 @ 4 %  
Tables ..... per gro. \$0.50 @ \$1.00

Springs—Door—  
Chicago (Coil) ..... 40 @ 10 %  
Gem (Coil) ..... 20 %  
Pullman (Coil) ..... 25 %  
Reliance (Coil) ..... 40 @ 10 %  
Star (Coil) ..... 30 %  
Torrey's Rod, 3 in. .... \$1 doz. \$1.10  
Victor (Coil) ..... 50 @ 10 @ 10 %

Carriage Wagon, &c.—  
1 1/2 in. and Wider: ..... Per lb.  
Black ..... 4 @ 1/4 @ 4 %  
Half Bright ..... 4 @ 1/4 @ 4 %  
Bright ..... 7 @ 1/4 @ 4 %

Painted Seat Springs:  
1 1/2 x 2 x 26 ..... per pr. 42 @ 4 %  
1 1/2 x 3 x 28 ..... per pr. 70 @ 4 %

Sprinklers, Lawn—  
Enterprise ..... 25 @ 30 %  
Philadelphia No. 1, \$1 doz. \$12; No. 2, \$15; No. 3, \$24 ..... 30 %  
Plunger & Henger Mfg. Co.: ..... 70 %  
Cactus ..... 75 %  
Japanese ..... 65 %  
Nationals ..... 65 %

Squares—  
Nickel plated. } List Jan. 5, 1900.  
Steel and Iron. } 75 @ 50 @ 75 @ 10 %  
Rosewood Hdl. Try Square and T-Berels ..... 60 @ 10 @ 10 @ 10 %  
Iron Hdl. Try Squares and T-Berels ..... 40 @ 10 @ 10 @ 10 %  
Diston's Try Sq. and T-Berels ..... 70 %  
Winterbottom's Try and Miter, No. 1, 40; No. 2 ..... 50 %

Squeezers, Lemon  
Wood, Common, gro. No. 0, \$5.25 @ \$5.50; No. 1, \$6.25 @ \$6.50.  
Wood, Porcelain Lined: ..... doz. \$1.00  
Good Grade ..... doz. \$1.25  
Tinned Iron ..... doz. \$0.75 @ 1.25  
Iron, Porcelain Lined ..... doz. \$1.75

Staples—  
Barbed Blind ..... lb. 6 @ 6 1/4 @ 4 %  
Electricians', Association list ..... 80 @ 10 @ 10 @ 10 %  
Fence Staples, Plain, \$2.25; Galvanized ..... \$2.55  
Poultry Netting Staples ..... per lb. 3 1/4 @ 3 1/4 @ 4 %

Steels, Butchers—  
Dick's ..... 30 %  
Foster Bros. .... 30 %  
C. & A. Hoffmann's ..... 40 %

Steelyards—  
30 @ 30 @ 10 %

Stocks and Dies—  
Blacksmiths' ..... 50 @ 50 @ 10 %  
Curtis Revolve Katchet Die Stock ..... 25 %  
Derby Screw Plates ..... 25 %  
Green River ..... 25 %  
Lightning Screw Plate ..... 25 %  
Little Giant ..... 25 %  
Reece's New Screw Plates ..... 25 %

Stoners, Cherry—  
Enterprise ..... 25 @ 30 %

Stones—Oil &c.  
Chicago Wheel & Mfg. Co., 1904 list:  
Gem Corundum Oil, Double Grit, 60 %  
Gem Corundum Oil, Single of Double Grit ..... 60 %  
Gem Corundum Slips ..... 60 %  
Gem Corundum Razor Hones ..... 50 %  
Pike Mfg. Co., 1904 list: ..... \$1 lb.  
Arkansas St. No. 1, 3 to 5 in. \$2.80  
Arkansas St. No. 1, 5 1/2 to 8 in. \$3.50  
Arkansas Slips No. 1 ..... \$1.00  
Lily White Washita, 4 to 8 in. 60 %  
Rosey Red Washita, 4 to 8 in. 60 %  
Washita St., Extra, 4 to 8 in. 60 %  
Washita St., No. 1, 4 to 8 in. 40 %  
Washita St., No. 2, 4 to 8 in. 30 %  
Lily White Slips ..... 30 %  
Rosey Red Slips ..... 30 %  
Washita Slips, Extra ..... 80 %  
Washita Slips, No. 1 ..... 70 %  
Washita Slips, No. 2 ..... 40 %  
India Oil Stones (entire list) ..... 33 1/2 %  
Quickest Emery and Corundum Oil Stone, Double Grit ..... 33 1/2 %

Quickcut Emery and Corundum Are  
Stone, Double Grit.....33 1/4%  
Quickcut Emery Rubbing Bricks.....33 1/4%  
Hindustan No. 1, R & L, 1 lb 8¢  
Hindustan No. 1, Small, 1 lb 10¢  
Aze Stones (all kinds).....5 to 10¢  
Turkey Oil Stones, Extra.....1 lb 80¢  
8 in.....1 lb 80¢  
Queer Creek Stones, 4 to 8 in.....20¢  
Queer Creek Slips.....40¢  
Sand Stone.....6¢

### Scythe Stones—

Chicago Wheel & Mfg. Co.:  
Gem Corundum, 10 in., \$8.00  
gro., 12 in., \$10.00  
Norton Emery Scythe Stones:  
Less than gross lots.....\$ gro. \$9.00  
One gross or more.....\$ gro. \$7.20  
Lots of 10 gross or more.....\$ gro. \$6.00  
Pike Mfg. Co., 1904 list:  
Black Diamond S. S., 1/2 gro. \$12.00  
Lamotte S. S., 1/2 gro. \$11.00  
White Mountain S. S., 1/2 gro. \$9.00  
Green Mountain S. S., 1/2 gro. \$6.00  
Extra Indian Pond S. S., 1/2 gro. \$7.50  
No. 1 Indian Pond S. S., 1/2 gro. \$7.00  
No. 2 Indian Pond S. S., 1/2 gro. \$4.50  
Leader Red End S. S., 1/2 gro. \$4.50  
Quick Cut Emery.....1/2 gro. \$10.00  
Pure Corundum.....1/2 gro. \$18.00  
Crescent.....1/2 gro. \$7.00  
Emery Scythe Rifles, 2 Coat, \$8  
Emery Scythe Rifles, 3 Coat, \$10  
Emery Scythe Rifles, 4 Coat, \$12  
Balance of 1904 list 33 1/4%

### Stoppers, Bottle—

Victor Bottle Stoppers.....1/2 gro. \$9.00

### Stops—Bench—

Millers Falls.....15¢ 10%  
Morrill's, No. 2, 1/2 in., \$1.00.....50¢  
Morrill's, No. 2, 1/2 in., \$1.00.....50¢

### Door—

Chapin-Stephens Co.....60¢ 10% 10%

### Plane—

Chapin-Stephens Co.....20%

### Straps—Box—

Cary's Universal, case lots.....20¢ 10% 10%

### Hame—

Covert's Saddlery Works.....60¢ 10%

### Stretchers, Carpet—

Cast Iron, Steel Points, doz.....60¢ 10% 10%

Socket.....doz. \$1.00

Excelsior Stretcher and Tack Hammer Combined, doz.....\$2.00

### Stuffers, Sausage—

Enterprise Mfg. Co.....\$2.50 10% 10%

National Specialty Co., list Jan. 1, 1902.....30¢ 5%

### Sweepers, Carpet—

National Sweeper Co.:  
Louis XV, Roller Bearing, Gold Plated.....\$120.00  
Pleppwhite, Roller Bearing, \$112.00  
Sheraton, Roller Bearing, N'kel \$90.00  
Ye Mission, Roller Bearing, Oxidized Coppered.....\$36.00  
Transparent, Roller Bearing, Plate Glass top, Nickel.....\$36.00  
National Queen, Roller Bearing, Fancy Venetian.....\$27.00  
Loyal, Roller Bearing, Venetian.....\$25.00  
Nickel.....\$25.00  
Triple Medal, Roller Bearing, Nickel.....\$24.00  
Marion, Roller Bearing, N'kel \$24.00  
Marion Queen, Roller Bearing, Nickel.....\$24.00  
Monarch, Roller Bearing, N'kel \$22.00  
Monarch, Roller Bearing, Jap. \$20.00  
Perpetual, Regular B'rs, N'kel \$20.00  
Perpetual, Regular B'rs, Jap. \$18.00  
Monarch Extra (17 in. case), Roller Bearing, Nickel.....\$36.00  
Monarch Extra (17 in. case), Roller Bearing, Japanned.....\$33.00  
Auditorium (20 in. case), Roller Bearing, Nickel.....\$34.00  
Mammoth (30 in. case), Roller Bearing, Nickel.....\$60.00

NOTE—Rebates: 50¢ per dozen on three dozen lots; \$1 per dozen on five dozen lots; \$2 per dozen on ten dozen lots; \$2.50 per dozen on twenty-five dozen lots.

Streator Metal Stamping Co.:  
Model E, Sanitaire.....1/2 doz \$25.00  
Model A, Sterling.....1/2 doz \$25.00  
Model B, Sterling, Nickel.....1/2 doz \$25.00  
Model B, Sterling, Japanned.....1/2 doz \$25.00  
Model C, Sterling.....1/2 doz \$21.00  
Model D, Sterling.....1/2 doz \$19.50

### Tacks, Finishing Nails, &c.

New List, May 1, 1905.

American Carpet Tacks.....90¢ 5% 10%

American Cut Tacks.....90¢ 5% 10%

Suedes Cut Tacks.....90¢ 5% 10%

Suedes Upholsterers' Tacks.....90¢ 5% 10%

Gimp Tacks.....90¢ 5% 10%

Lace Tacks.....90¢ 5% 10%

Trimmers' Tacks.....90¢ 5% 10%

Looking Glass Tacks.....65¢

Hill Posters and Railroad Tacks.....90¢ 5% 10%

Hungarian Nails.....85¢

Finishing Nails.....70¢

Trunk and Clout Nails.....80¢ 5%

NOTE—The above prices are for Standard Weight. An extra 5¢ is given on Medium Weight, and an extra 10¢ is given on Light weight.

### Miscellaneous—

Double Pointed Tacks.....90¢ 5% 10%

Steel Wire Brads, R. & E. Mfg. Co., list.....50¢ 10% 10%

See also Nails, Wire.

### Tanks, Oil—

Emerald, S. S. & Co.....30-gal. \$3.40

Emerald, S. S. & Co.....60-gal. \$4.25

Queen City, S. S. & Co.....30-gal. \$3.65

Queen City, S. S. & Co.....60-gal. \$4.50

### Tapes, Measuring—

American Asahi Skin.....50¢ 5% 10%

Patent Leather.....\$5 30¢ 5% 10%

Steel.....3 1/2 35¢ 5% 10%

Chesterman's.....25¢ 25¢ 5% 10%

Eddy Asses' Skin.....10¢ 10% 50%

Eddy Patent Leather.....25¢ 30¢ 5%

Eddy Steel.....40¢ 40¢ 10%

Keuffel & Esser Co.:  
Favorite, Ass Skin.....40¢ 10% 50%

Favorite, Duck and Leather.....25¢ 50¢ 10%

Metallic and Steel, lower list.....35¢ 35¢ 5%

Pocket.....35¢ 35¢ 5%

Larkin's:  
Asses' Skin.....40¢ 10% 50%

Metallic.....30¢ 30¢ 45%

Patent Bend, Leather.....25¢ 50¢ 10%

Pocket.....35¢ 35¢ 5%

Steel.....33¢ 33¢ 5%

### Teeth, Harrow—

Steel Harrow Teeth, plain or headed, 1/2-inch and larger... per 100 lbs. \$3.00

### Thermometers—

Tin Case.....80¢ 10% 80¢ 10% 5%

### Ties, Bale—Steel Wire—

Single Loop.....80¢ 10% 5%

Monitor, Crank Head, 40.....70%

### Brick Ties—

Niagara Brick Ties.....25¢ 10%

### Tinners' Shears, &c.—

See Shears, Tinners', &c.

### Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

### Tips, Safety Pole—

Covert's Saddlery Works.....60¢ 10%

### Tire Benders, Upsetters, &c.—

See Benders and Upsetters, Tire.

### Tools—Coopers'—

L. & I. J. White.....20¢ 20¢ 5%

### Hay—

Myers' Hay Tools.....50%

Stowell's Hay Carriers.....50%

Stowell's Hay Forks.....50%

Stowell's Fork Pulleys.....50%

### Miniature—

Smith & Hemenway Co.....35%

### Saw—

Atkins' Cross Cut Saw Tools.....40%

Simonds' Improved.....33 1/4%

Simonds' Crescent.....25%

### Ship—

L. & I. J. White.....35%

### Transom Lifters—

See Lifters, Transom.

### Traps—Fly—

Balloon, Globe or Acme, doz. \$1.15; \$1.25; gro. \$11.50; \$12.00

Harper, Champion or Paragon, doz. \$1.25; \$1.40; gro. \$13.00; \$13.50

### Game—

Oneida Pattern.....75¢ 10% 75¢ 10% 5%

Newhouse.....40¢ 10% 5%

Hawley & Norton.....65%

Victor.....70¢ 10%

Oneida Community Jump.....50%

### Mouse and Rat—

Mouse, Wood, Choker, doz. holes 84¢ 9¢

Mouse, Round or Square Wire, doz. \$5.00 9¢

Marty French Rat and Mouse Traps (Genuine):  
No. 1, Rat, each \$1.21; 1/2 doz. \$13.25  
No. 3, Rat, 1/2 doz. \$4.50; case of 50 \$6.75 doz.

No. 3 1/2, Rat, 1/2 doz. \$5.25; case of 72 \$7.75 doz.

No. 4, Mouse, 1/2 doz. \$3.85; case of 150 \$5.00 doz.

No. 5, Mouse, 1/2 doz. \$3.00; case of 150 \$2.25 doz.

### Trimmers, Spoke—

Wood's E.....50%

### Trowels—

Disston Brick and Pointing.....30%

Disston Plastering.....25%

Disston "Standard Brand" and Garden Trowels.....35%

Kohler's Steel Garden Trowels, 5 in. 1/2 doz. \$1.80

Kohler's Steel Garden Trowels, 6 in. 1/2 doz. \$2.00

Never-Break Steel Garden Trowels.....1/2 doz. \$4.00

Rose Brick and Plastering.....25¢ 5%

Woodrough & McFarlin, Plastering.....25%

### Trucks, Warehouse, &c.—

B. & L. Block Co.:  
New York Pattern.....50¢ 10%

Western Pattern.....60¢ 10%

Handy Trucks.....1/2 doz. \$16.00

Grocery.....1/2 doz. \$15.00

Daisy Store Trucks, Improved Pattern.....1/2 doz. \$15.50

McKinney Trucks.....each \$10.00

Model Store Trucks.....1/2 doz. \$18.50

### Tubs, Wash—No. 1 & 3

Galvanized, per doz. \$4.25 1/2 5 25

Galvanized Wash Tubs (S. & Co.):  
No. 1, 2 1/2 3 10 20 30

Per doz., net \$5.70 6.30 7.20 8.00 7.20 8.10

### Twine, Miscellaneous—

Flax Twine: DC. B.  
No. 2, 3/4 and 1/2 lb. Balls.....22¢ 24¢

No. 12, 1/4 and 1/2 lb. Balls.....18¢ 20¢

No. 16, 1/4 and 1/2 lb. Balls.....16¢ 18¢

No. 24, 1/4 and 1/2 lb. Balls.....16¢ 18¢

No. 36, 1/4 and 1/2 lb. Balls.....15¢ 17¢

Chalk Line, Cotton 1/2 lb. Balls.....25¢ 30¢

Cotton Mops, 6, 9, 12 and 15 lb. 1/2 doz. \$1.00 18¢

According to quality, 3 Balls to 1 doz.

American 2-Ply Hemp, 1/4 and 1/2 lb. Balls.....13¢ 14¢

American 3-Ply Hemp, 1/4 and 1/2 lb. Balls.....13¢ 14¢

India 2-Ply Hemp, 1/4 and 1/2 lb. Balls.....9¢ 14¢

Balls (Spring Twine).....9¢ 14¢

India 3-Ply Hemp, 1/4 lb. Balls.....9¢ 14¢

India 3-Ply Hemp, 1/2 lb. Balls.....7¢ 8¢

2, 3, 4 and 5-Ply Jute, 1/4 lb. Balls.....9¢ 10¢

Mason Line, Linen, 1/2 lb. B's.....16¢

No. 25, Mattress, 1/4 and 1/2 lb. Balls.....37¢

Wool, 3 to 6 ply.....B 5¢ 1/2; A 6¢

### Vises—

Solid Box.....60¢ 10% 60¢ 10% 10%

### Parallel—

Atliol Machine Co.:  
Simpson's Adjustable.....40%

Standard.....40%

Anastor.....25%

Columbian Bldg. Co.....10%

Emmert Universal:  
Pattern Makers' No. 1, \$15.00; No. 2, \$12.50.

Machine and Tool Makers' No. 1A, \$12.50; No. 5A, \$7.00; No. 6A, \$10.00; No. 10A, \$22.50.

-Presto Quick Acting.....25¢ 25¢ 5%

Tiger Machinists'.....40%

Fisher & Norris Double Screw.....15¢ 10%

Hollands:  
Machinists'.....10¢ 40¢ 5%

Keystone.....55¢ 50¢ 10%

Levis Tool Co.:  
Adjustable Jaw.....30%

Monarch.....50%

Solid Jaw.....50%

Merrill's.....20%

Millers Falls.....60¢ 10%

Mansey Vise Co.:  
Clamp.....40%

Perfect.....20%

Lightning Grip.....20%

Parker's:  
Victor.....20¢ 25%

Regulars.....20¢ 25%

Combination Pipe.....10¢ 45%

Prentiss.....20¢ 25%

Sargent's.....40%

Snediker's X. L.....33 1/4%

Stephens'.....33 1/4%

Williamson Mfg Co. Double Swivel.....40¢ 5%

### Saw Filers—

Disston's D 3 Clamp and Guide, 1/2 doz. \$2.00

Perfection Saw Clamps, 1/2 doz. \$1.50

Reading.....1/2 doz. \$1.00

Wentworth's Rubber Jaw, No. 1, 1/2 and 3.....45¢ 50%

### Wood Workers—

Mansey Vise Co.:  
Lightning Grip.....15%

Perfect.....15%

Wyman & Gordon's Quick Action, 6 in., \$6.00; 9 in., \$7.00; 11 in., \$8.00.

### Miscellaneous—

Bigall & Acker Combination Pipe Vise.....60¢ 10%

Holland's Combination Pipe.....60¢ 60¢ 5%

Mansey's Quick Action Pipe.....60¢ 60¢ 5%

Parker's Combination Pipe:  
8 Series.....60%

18 Series.....60¢ 5%

Williamson Mfg Co. Double Swivel Combination Pipe.....40¢ 5%

### Wads—Price per M.

B. E., 11 up.....60¢

B. E., 9 and 10.....70¢

B. E., 8.....80¢

B. E., 7.....80¢

P. E., 11 up.....1.00

P. E., 9 and 10.....1.25

P. E., 8.....1.50

P. E., 7.....1.50

Ely's B. E., 11 and larger, \$1.70; 1.75

Ely's P. E., 12 to 20.....\$3.00; 3.25

